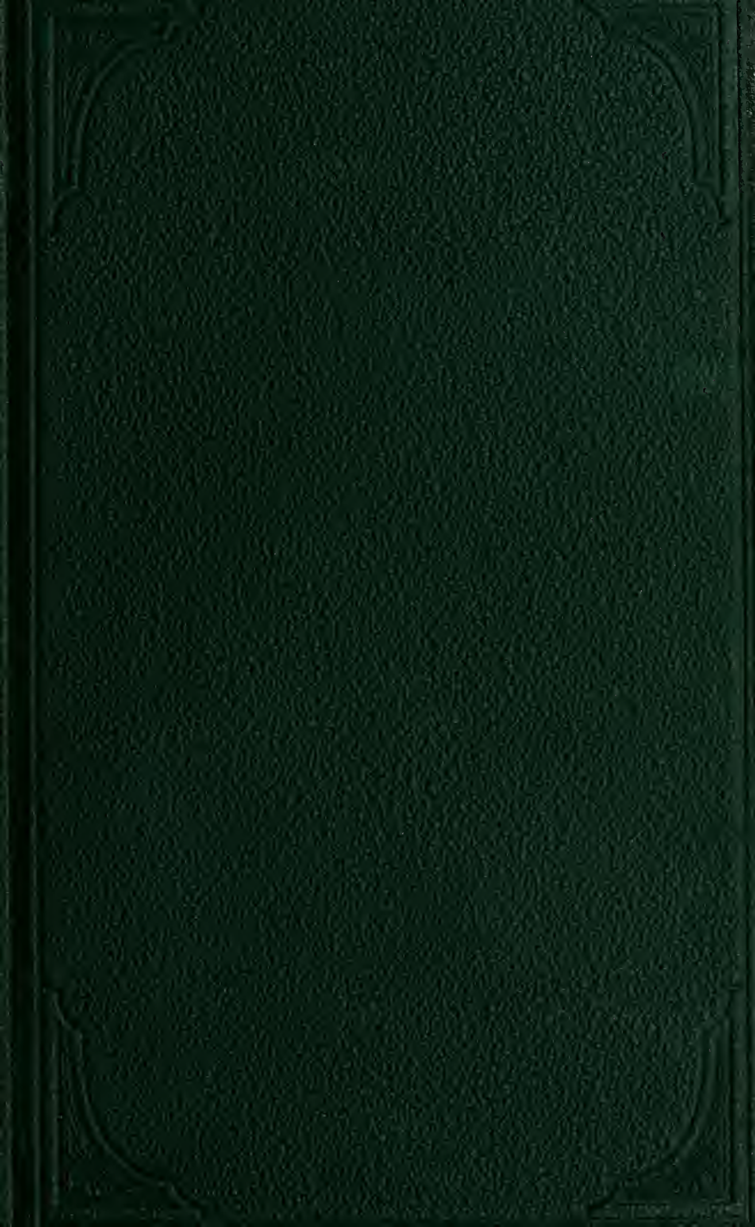

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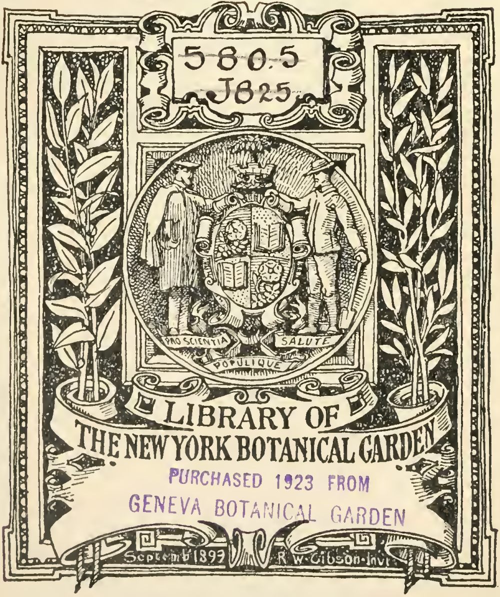
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JOURNAL OF BOTANY

BRITISH AND FOREIGN.

Edited by

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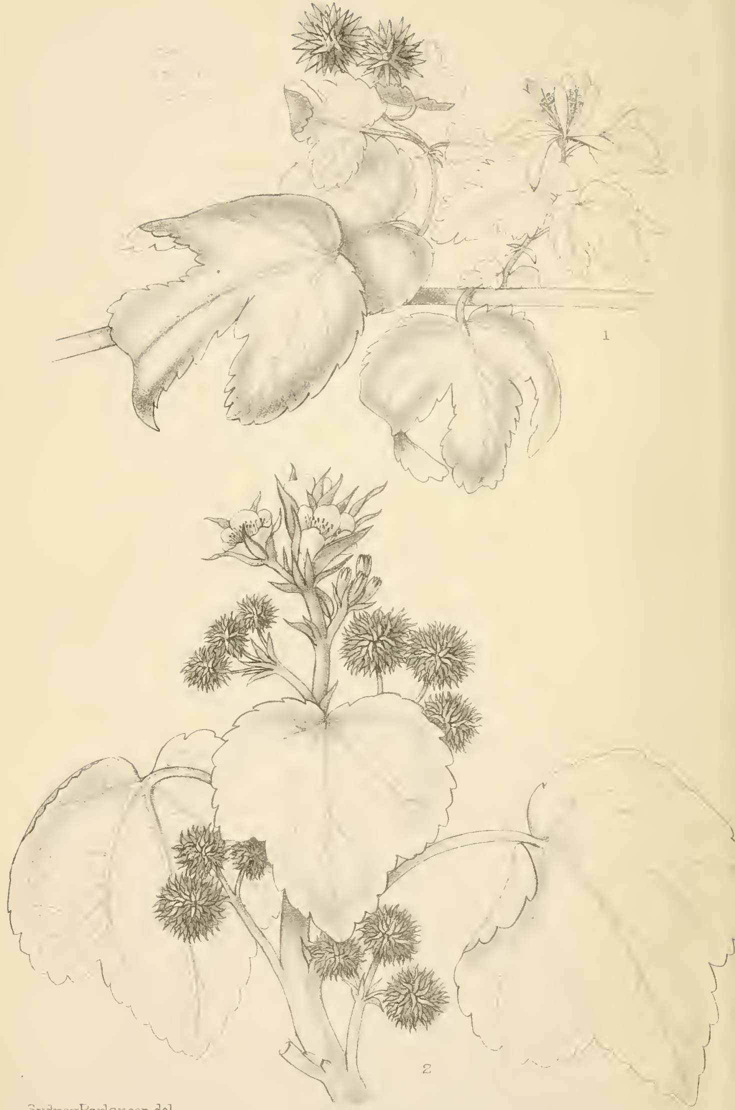
Directions to Binder.

TAB. 293 . . . . . to face page 1
TABS. 294 & 295 33
TAB. 296 65
,, 297 161
,, 298 257
PORTRAIT 289
TAB. 299 . . . . . . ,, 321
PORTRAIT . . . . . . ,, 353

Or all may be placed together at the end of the volume.



Sydney Parkinson del
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West, Newman imp.

1. Triumfetta subpalmata *Solanum*
2. procumbens *Forster.*

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BRITISH AND FOREIGN.

ON AN OBSCURE SPECIES OF *TRIUMFETTA*.

By W. Botting Hemsley, F.R.S., A.L.S.

(Plate 293).

Several species of *Triumfetta* are essentially sea-side plants, inhabiting sandy shores, close down to the high-water line in tropical regions; and two or three species are widely dispersed in the remote islands of the Pacific and Indian Oceans, being among the earlier herbaceous flowering plants, with such others as *Ipomœa biloba* Forsk. (*I. Pes-Capræ* Sweet) and *Canavalia obtusifolia* DC., that establish themselves on coral islands, from seeds cast ashore in their light prickly fruits by tidal waves. The commonest of them is *T. procumbens* Forster, named, it may be observed, by one of the botanists to Captain Cook's second voyage round the world; but with this another species has been confused by later botanists, including myself in my various contributions to insular floras in the botany of the 'Challenger' Expedition and elsewhere, although it had been distinguished and named in manuscript attached to specimens in the herbarium of the British Museum by Banks and Solander, the botanists to Cook's first voyage.

AUG 7 - 1923

Some four or five years ago, it fell to my lot to name a small collection of dried plants, made by the late Dr. M. Fraser in British North Borneo. Among these plants was the *Triumfetta* in question, which had been confused with *T. procumbens*, and I identified it with specimens collected in Northumberland Islands, off the coast of Queensland, by Robert Brown, on Flinders's voyage to Australia, and bearing the unpublished name of *T. subpalmata* Solander. At the same time I examined all the specimens of *Triumfetta* in the Kew Herbarium referred to *T. procumbens*, and I had no difficulty in distinguishing two forms or species; but as there was no intention of publishing an account of the Bornean collection, nothing further was done in the matter.

In the early part of 1889, however, we received, at Kew, a collection of dried plants made by Dr. Guppy in the Keeling or

Cocos Islands, in the Indian Ocean, and this collection contained both the true *Triumfetta procumbens* and *T. subpalmata*.*

I accordingly requested Mr. E. G. Baker, of the Botanical Department, British Museum, to examine the original specimens conserved there, which he did, and also kindly furnished me with tracings of original drawings; and I have since had the opportunity of comparing them myself, with the result that there is no doubt that two very distinct species have been confused under the name of *T. procumbens*. They may be defined briefly as follows:—

1. *Triumfetta procumbens* Forster Prodr. Fl. Ins. Austral. p. 35; Hook. et Arn. Bot. Beech. Voy. p. 60 (non Benth. Fl. Austral. i. p. 273, nec auct. alior., saltem pro maxima parte). Syn. *T. crassifolia* Solander; Seem. Fl. Vit. p. 26, et forsan *T. Fabreana* Gaud. Bot. Voy. Freyc. t. 102. Folia longe petiolata, molliter tomentosa, rotundato-ovata vel cordata, indivisa vel trilobata, simul crenata. Fructus longe flaccideque multiaculeatus, aculeis plumosis.

2. **Triumfetta subpalmata** Solander, Herb. Mus. Brit. et in Icon. Park. in Bibl. Mus. Brit. ined., syn. *T. procumbens* Benth. Fl. Austral. i. p. 273, præter specimen a A. Cunningham lectum.

Folia breviter petiolata, rigida, scabrida, alte 3–5-lobata, simul argute dentata. Fructus breviter rigideque aculeatus, aculeis glabris.

There are slight differences in the flowers of these two species, but I have limited the diagnoses to their striking characteristics. The first is apparently much the more widely spread, ranging from Seychelles, Diègo Garcia, and the Keeling Islands, through the Malay Archipelago, and all over Western Polynesia; and A. Cunningham collected it in Fitzroy Island, off the coast of Queensland.

The second is known to inhabit Java and Borneo, several islands off the coast of Cochin China, the Keeling Islands, and the Northumberland, Howick, Frankland, and other groups of islands off the coast of Queensland.

The accompanying figures are from the original drawings by Sydney Parkinson in the Department of Botany of the British Museum.

EPILOBIUM NOTES FOR 1889.

By the Rev. Edward S. Marshall, M.A., F.L.S.

During the past season, I have examined many thousands of living specimens, chiefly in W. Surrey, paying special attention to hybrids. The result has been gratifying, as several combinations new to the British Flora have been obtained (marked below with an asterisk), and two of these had not been previously observed elsewhere. Specimens from nearly all my gatherings (amounting to close on 170), were sent, together with some others collected by Messrs. Beeby, Bennett, Geldart, and the Rev. E. F. Linton, to Prof. Haussknecht. I cannot sufficiently thank him for his great kindness, and the care with which he has scrutinized such a large and troublesome mass of material. In the great majority of instances, he has confirmed my suggested names; and, in almost every case where it was otherwise, I can see the correctness of his trained opinion. Dr. Buchanan White has also sent me his Perthshire willow-herbs to look over, some of which are named below, to the best of my ability.

---

* It may be mentioned in connection therewith, that the Keeling Islands are about 600 miles from the nearest land, and were first botanically and otherwise explored by Darwin; and Dr. Guppy went thither to investigate more fully the composition and origin of the flora and other phenomena, the results of which have not yet, I believe, been published.

Nearly all our species vary greatly, within certain well-defined limits, the variations being usually traceable to climate, soil, or situation. But I can find no connecting links (other than crosses) between such allied plants as *adnatum*, *Lamyi* and *obscurum*, or *lanceolatum* and *montanum*. Here the importance of studying the spring or autumn rosettes is well illustrated; for the "life-history" of the plants reveals structural differences which are seldom visible in herbarium-specimens.

The hybrids are, as might have been expected, even more variable; being subject to the same local influences, and also inclining, sometimes to the one, sometimes to the other parent. In many cases they are readily distinguishable, when fresh and in good condition (of course careful drying is necessary, if the characters are to be well shown); but in others, such as the combinations of the "*tetragonum*" group with one another, the determination is far from easy. A fair knowledge of the forms assumed by the parent species is indispensable, in order to attain anything like certainty. Hybrids between plants belonging to the sections "Synstigma" and "Schizostigma" appear to have the stigma, almost invariably, what may be called "obsoletely four-cleft."

It will be observed that three "triple hybrids" are mentioned. When writing his monograph, Prof. Haussknecht does not seem to have been convinced that such things existed in the genus; but he names the undermentioned ones with no expression of doubt, and I have no choice but to record them on his authority.

I think it probable that our list of British hybrids may be increased to about forty, even if *E. collinum* (which Mr. Druce tells me he failed to find again in its only known British station) should prove to be really an extreme rarity with us. The work done by Mr. Archer Briggs around Plymouth, and Mr. Towndrow at Malvern, together with the result of two years' study in one corner of Surrey, proves that local botanists, in neighbourhoods where several species occur, can do much to increase our knowledge of the British willow-herbs.

Epilobium angustifolium L., f. *brachycarpa* (*E. brachycarpum* Leighton). The Rev. E. F. Linton has shewn me this, from the ravine of the Unich Water, Forfarshire, which is several miles distant from any garden; and I have seen it from several mountainous parts of Perth and Aberdeen. This quite disposes of the allegation that it is not indigenous. In the same spot, near Tilford, where I gathered it last year, I could only find the f. *macrocarpa* this season; and strongly suspect, as I had not interfered with the roots, that *the same individuals* had produced the two different capsules in two successive years, having been duly fertilized in the second, but not in the first.

E. PARVIFLORUM Schreb., f. *aprica*. This proves to be an exceedingly common state of the plant in Surrey, and doubtless is so elsewhere; varying in height from six inches upwards. A specimen gathered on weald clay, near Hambledon, was 53 inches high by actual measurement, and stout in proportion. In one case it occurred as a sport, with the leaves in threes:—

f. *trifoliata*. This I have also seen from Perthshire. A shade-grown state from Worplesdon is f. *umbrosa*, with flaccid, bright-green leaves. Mr. Beeby collected another, in a meadow near Felbridge, Surrey, with short, broadly ovate-acute leaves, which is referred to f. *brevifolia* = *E. cordatum* Biv.

E. MONTANUM L., f. *albiflora*. Near Witley, Surrey; Finlarig, Perthshire (leg. F. B. White). Seemingly much scarcer in Britain than a state which has the unfertilized flowers white, afterwards changing to pale pink, as in *lanceolatum* and *roseum*.

f. *verticillata*. Not unfrequent about Witley. I also have it from Tilford, and from Wye, E. Kent; and Dr. White found it at Lynedoch, Perthshire. Koch and Grenier and Godron ranked it as a variety; but I doubt its constancy, and, at best, it is no more than a "sport."

E. LANCEOLATUM Seb. & Maur. Mr. Bennett sends a seedling form from near Croydon, which appears to be a new locality.

f. *simplex*. Sunny bank near Bowler Green; a small, unbranched, probably seedling plant, 4–10 in. high.

f. *umbrosa*. Lanes near Brook and Bowler Green. Leaves usually flaccid, light-green, longer and broader than in the open-ground state, which not unfrequently reaches a height of three feet.

E. ROSEUM Schreb. The Rev. E. F. Linton has gathered this near Nayland, Suffolk (a new county record). Among the states which I have collected this year, one from a cottage-garden near Witley is placed near f. *angustifolia*; the leaves are lanceolate, erect, rather shortly petioled.

f. *umbrosa*. Elstead and Worplesdon, by wooded streamlets; also sent by Messrs. Bennett and Miller, from gardens at Croydon; and by Mr. Beeby, from Felbridge. A glabrescent plant, with deep-green, thin, broad, flaccid leaves, the lower ones on long stalks; flowers small.

E. ADNATUM Griseb., f. *simplex*. Near Tilford and Hascombe, Surrey, and between Cranbrook and Benenden, E. Kent; usually the seedling plant, but sometimes a starved state of poor soils that has survived the winter. If cultivated, it quickly changes, like all the "forms" I have experimented with.

f. *stenophylla*. Witley, Tilford and Hascombe, Surrey; Cowick, Yorks. This appears to be the usual state in my neighbourhood.

f. *umbrosa*. In a shady fir-plantation near Tilford.

E. OBSCURUM Schreb. On sandy soil, even when decidedly dry, this often spreads over a square yard of ground by its rooting stolons, about the thickness of packing-thread; they frequently connect the plants, even at the flowering-season, which explains the name of "*chordorhizum*" given to this species by Fries.

f. *annua.* Near Cranbrook, Kent.

f. *strictifolia.* Tilford and Hascombe, Surrey; Kingshouse, Argyle; also roadside near Bridge of Lochay, Perthshire (leg. Meldrum).

f. *minor.* Gravelly stream-side near Inveroran, Argyle.

f. *elatior.* Strathord, Perthshire (leg. B. White), &c.

f. *flaccida.* Felbridge, Surrey (leg. Beeby); Broxy, Perthshire (leg. B. White),

f. *crassicaulis.* This is the most luxuriant and strongest state that I have met with, preferring sunny slopes on a light soil; it often reaches four feet in height, with a stem nearly as thick as a goose-quill. It is plentiful in one locality near Witley; and I have seen it from two Perth stations (leg. B. White), as well as from Rhyader, Radnor (leg. Hanbury & Ley).

[In the Boswell Herbarium there is a specimen of *E. obscurum*, gathered in "the fifties," which was labelled by one of our best botanists as "*E. Lamyi*," showing the confusion of names in this group, then prevalent].

E. LAMYI F. Schultz. This plant is, beyond all question, a true native in W. Surrey, and far from rare in my neighbourhood; decidedly less so than *E. adnatum*. It occurs in all sorts of places, and often far from cultivation. In addition to several new stations about Witley, I have found it plentifully near Hambledon and Hascombe, and close to Woking Station. The general impression seems to be that it is a *small* plant; but I have measured specimens 36 and 37 inches in height, and that is scarcely abnormal for the "forma *biennis*." It is often very much branched, and with several hundred flowers on a single specimen. The seedling state (f. *annua*) is not unlike the similar form of *E. obscurum* in appearance, when dried, though easily distinguished by its texture, colouring, &c., when growing. The petals of *Lamyi* are, as a rule, longer and broader than those of *obscurum*, and their tone of colour is different, being rather a "*yellow*-rose" than a "*purple*-rose"; the petals of *adnatum* being usually smaller than in the other two, and more of a "*pink*-rose." These are, however, somewhat empirical distinctions. I have not yet learnt to distinguish with certainty between the rosettes of *Lamyi* and *adnatum;* the former seem to have shorter, more petiolate, and more entire leaves, but I can see little difference in texture and colouring. At the flowering-season, however, the two are not hard to separate, and I consider them both good species. *E. obscurum* is so totally alien to them in manner of development, that its degradation to a "sub-species" appears quite groundless. *E. Lamyi* should certainly be found in Sussex and Hants, and probably in several other counties.

E. PALUSTRE L. This is not recorded in Top. Bot. for Glamorgan; the Rev. E. F. Linton recently gathered it, near Crymlyn.

It seems to vary almost indefinitely, especially in the North. Mr. Miller sends several forms from Caithness and Sutherland, and Mr. Beeby others from Shetland. I found a white-flowered state in Glen Falloch, Perthshire, and one with flesh-coloured flowers near Kingshouse, Argyle.

Var. *lapponicum* Wahlenberg (*ex parte*) occurred very sparingly in a small bog near Kingshouse, Argyle, at 2000 ft., with *E. anagallidifolium*, and I rather suspected it to be a hybrid. The stem is short (5 or 6 inches in my specimens), stout, erect from a curved base, few-flowered, nodding at the top, the lower leaves being obovate, more than half as broad as long, glabrous, fleshy and rigid, broadly rounded at the tip; the upper ones almost veinless, subglabrous; the flowers small ($\frac{1}{5}$ in.), white or pale flesh-coloured.

E. ALSINEFOLIUM Vill. Specimens brought from Clova, last year, developed greatly in a shady corner of my garden, producing leaves nearly an inch broad, and flowers quite $\frac{1}{2}$ in. across, when fully expanded; but did not attain the luxuriance of a form found by Mr. Hanbury and myself in one of the side-valleys of Glen Etive, Argyle, which in some cases was 18 or 20 inches high. It grew in a mossy rill, at 2600 feet.

E. ANAGALLIDIFOLIUM Lam., f. *scapoides*. In the same locality with the last-named plant. Mr. W. F. Miller also gathered it in 1888, on Ben Lawers. In this state the capsule seems like a prolongation of the stem, which has thus a scape-like appearance. It is described as single-flowered, but some of my specimens are three-flowered.

I have been able, thanks to Mr. Hanbury, to carefully examine Dr. Boswell's willow-herbs, and can confidently say that, although he figures *two* plants in E. B., ed. 3, as "*E. alpinum*" and "*E. anagallidifolium*" (I have not seen these figures recently), all his specimens under both names are the present species, with the possible exception of a Braemar plant, which may be a hybrid. The same remark applies to the various specimens in Herb. Brit. Mus., and to the Perthshire set sent to me by Dr. White.

*E. ADNATUM × LAMYI (*E. semiadnatum* Borbas). Near Tilford; between Hambledon and Hascombe; and in a wealden copse near Witley. Some of the specimens shew an approach to *Lamyi*, while others are nearer *adnatum*. As a rule, the leaves have little tendency to be decurrent by their blade, as in the latter species, but are shortly petioled. On record from some half-dozen localities in Germany, Switzerland, and Hungary.

E. ADNATUM × OBSCURUM. Sandy ground near Tilford; very scarce. Quite a different form from that found last year near Witley, having grown in a drier situation and on a lighter soil.

E. ADNATUM × PARVIFLORUM (*E. Weissenburgense* F. Schultz). In the same locality as the last, and also very scarce; approaching *adnatum* in the flowers, and *parviflorum* in the leaves. I believe it has only been gathered before in Britain by Mr. Briggs, though known from twenty Continental stations. Several Plymouth specimens are at S. Kensington.

*E. HIRSUTUM × LANCEOLATUM (*E. Surreyanum* mihi), hybr. nov.

By a small stream near Worplesdon, Surrey; only two plants seen. "The toothing and colouring of the leaves point distinctly to *E. lanceolatum;* their shape is nearer *hirsutum,* but in the young leaves the narrowing into the petiole can be clearly seen" (Hausskn. *in litt.*). In the specimen sent, the leaves are considerably nearer *hirsutum* than in the other. I fully agree with the determination, which had not previously occurred to me, as I had not met with *lanceolatum* in the neighbourhood; it is, however, quite likely to be found, and no other combination will at all fit the plant, which is an unmistakable hybrid. Not having dug up the roots, I hope to gather it again. A short description may be of use:—Stem terete, without decurrent lines, softly hairy (much less so than in *hirsutum*), more or less branched from below the middle, 1½–2 ft. high. Leaves ½–2 in. long, lanceolate, sessile or shortly petioled, denticulate, finely hairy on both sides, much tinged with red when full-grown. Capsules small, ¾–1¼ in. long; seeds undeveloped and shrivelled. Buds erect, apiculate, half the size of those of *hirsutum;* petals ¼ in. long, deep rose. Style very long; stigma shortly and irregularly 4-cleft.

*E. HIRSUTUM × OBSCURUM (*E. anglicum* mihi), hybr. nov. Near Worplesdon. Only one specimen was gathered, as it was taken for an abnormal *E. parviflorum;* but probably there was more of it. I was pressed for time to catch a train, and did not make a careful examination. "The faint decurrent lines, amount of hairiness and shape of the leaves, innovation [*i. e.* stolons], &c., point to *E. obscurum,* the flowers and longer hairs to *hirsutum*" (Hausskn. *in litt.*). The parents grow together in plenty at the spot. Description:—Plant two feet or more in height. Rootstock stout, with short ascending stolons (not fully developed in my specimen); stem branched from the base, obscurely quadrangular when dry, subglabrous below, softly hairy above. Leaves oblong or lanceolate, acute, rather faintly denticulate (*i. e.,* more so than in *obscurum,* but less so than in *hirsutum*), glabrous above, with short scattered hairs on the under-surface. Ends of the young branches, and the under-surface of their young leaves, cano-pilose with white hairs. Capsules 1½–2 in. long, with whitish ascending hairs and a few glandular ones, slender; seeds all shrivelled and sterile. Buds bluntly apiculate, about ⅓ the usual size of those of *hirsutum;* petals rose-purple, ¼ in. long; stigmas shortly 4-cleft, much as in normal *parviflorum.*

I have given special names to these two plants, at Prof. Haussknecht's suggestion, and for the sake of uniformity, though the practice is a questionable one.

*E. LAMYI × LANCEOLATUM (*E. ambigens* Hausskn.). Sunny slopes near Witley, with both parents; and sandy ground near Tilford, with *E. Lamyi.* This is a very interesting discovery, as the hybrid was only known previously by an imperfect garden specimen, from a root collected near Klingenmünster by F. Schultz, and considered by him to be *lanceolatum* × *tetragonum.* I have not seen *E. lanceolatum* about Tilford, but have no doubt that it will be found, if searched for, as it grows abundantly on the same formation, within four or five miles. The determination is clearly correct, though there is a decided leaning towards *Lamyi*. The Witley plants were quite unmistakable, being exactly intermediate between the two species. In both localities it was very scarce.

*E. LAMYI × OBSCURUM (*E. semiobscurum* Borbas). Near Tilford, and in an ash-plantation on the edge of the wealden near Witley (seeds imperfect); both parents being abundant in each case. As it would be natural to expect, this is a difficult hybrid to make certain of, especially when it approaches *obscurum;* but my own determination is confirmed by Prof. Haussknecht. Its only previously recorded stations are the Ettersberg, a hill near Weimar, and Elm, near Brunswick; the latter being very doubtful, as *E. obscurum*, f. *minor*, was erroneously assigned by Borbas, who named the Brunswick plant, to this hybrid.

*E. LAMYI × PARVIFLORUM (*E. Palatinum* F. Schultz). Near Tilford, with the parents. Rather variable, but easily distinguished. Recorded from six German stations.

E. LANCEOLATUM × MONTANUM (*E. neogradiense* Borbas). Scarce, on sunny slopes near Witley, where the two species grow intermingled in great profusion. There is a fine series in Herb. Brit. Mus., collected in several stations near Plymouth by Mr. Briggs.

E. LANCEOLATUM × OBSCURUM (*E. Lamotteanum* Hausskn.). In the same station as the last, near Witley, but much more plentiful. Here, like the prevailing states of the parents, it is a fine tall plant, often four feet high. It usually occurs in a form nearer *obscurum*, but distinguishable at a glance by its habit and colouring, and by the stigma being rudimentarily four-lobed; the flowers are always pale rose, never white at first, as in *lanceolatum*. A second and scarcer form is liable to be confused with *montanum* × *obscurum*. Previously found in Britain by Messrs. Briggs and Trimen, near Plymouth, and Mr. Druce, near Canterbury; and known on the Continent from three French and two German localities. In the shady lanes I have not succeeded in finding any *lanceolatum* hybrids, but only in the open.

E. MONTANUM × OBSCURUM. This will certainly prove to be very common. I have found it abundantly near Tilford, between Hascombe and Dunsfold, in two spots near Witley, and in three near Chiddingfold, always in company with both parents. It has also been sent from Shirley, Derbyshire (leg. Rev. W. R. Linton), and from Rhyader, Radnor, in a very strong form (leg. Hanbury and Ley). In two stations I found specimens with the leaves in threes; and this verticillate form is in the Perthshire collection from three different localities (Perth, Lake of Monteith, and Strathord), shewing that the hybrid is probably frequent in the county. Two states occur, a "f. *umbrosa*," and a "f. *aprica*," the latter being always much tinged with red.

E. MONTANUM × PARVIFLORUM. Near Tilford, Chiddingfold, and between Hambledon and Hascombe. Usually the flowers are larger than those of either parent. Very variable in habit and luxuriance, according to the conditions of growth.

E. MONTANUM × ROSEUM (*E. heterocaule* Borbas). Near Worplesdon, sparingly. Intermediate in character; stigma obsoletely four-lobed; petals, when first unfolded, pale flesh-coloured, with darker veins. A beautiful and very different state has been gathered at Malvern by Mr. Towndrow, which looks like the offspring of a narrow-leaved *roseum* and an unusually toothed *montanum*, both being forms of an open, sunny situation. Recorded from many German stations.

E. OBSCURUM × PALUSTRE (*E. Schmidtianum* Rostkov.). Ditches near Peperharow, Surrey, with the parents. Forms which I consider to be this hybrid are in the Perthshire collection from Glen Artney, Ochtertyre, Rae Loch, Pitcairn Green, and Keltie Den, all collected by Dr. White; those from the two last-named places appear to be shade-grown plants.

E. OBSCURUM × PARVIFLORUM (*E. Dacicum* Borbas). In plenty near Tilford, both as a "f. *aprica*" and a "f. *minor*"; ditch near Witley; between Hambledon and Hascombe; in three states ("f. *major*," "*aprica*," and "*umbrosa*"), near Worplesdon. In each case both species were present. Also seen from Abernethy, E. Perth (leg. Drummond-Hay).

*E. OBSCURUM × ROSEUM (*E. brachiatum* Celakovsky). Sparingly near Worplesdon; also near Elstead (a form approaching *obscurum*, f. *flaccida*). For some reason or other, these two appear to cross much less freely than *parviflorum* and *roseum*. When well-developed, this is a pretty and characteristic hybrid, showing its origin quite plainly. Seeds imperfect in all my specimens. Recorded from about a dozen places in Germany and Transylvania.

E. PALUSTRE × PARVIFLORUM. The Rev. W. Moyle Rogers kindly gave me a specimen from Bridgerule, N. Devon, where he has frequently observed it. In the Perthshire collection is a plant from near Cherrybank (leg. Meldrum), which belongs here.

*E. PALUSTRE × ROSEUM (*E. purpureum* Fries). Ditch near Worplesdon; only one plant seen, which was much more closely allied to *palustre* than to the other. Flowers very small, pale lilac-rose. Seeds towards *palustre*, partly developed, but sterile. The distinctly-petioled and obscurely-toothed lower leaves, together with the flowers, shew the influence of *roseum*. I expect to find this also near Elstead, Surrey, where the two species occur together in good quantity,

E. PARVIFLORUM × ROSEUM. In great quantity, and extremely variable, near Worplesdon; every gradation being met with, from a state six inches high to one reaching nearly four feet, and branching from the base. Sparingly near Elstead, and in two spots near Witley; also near Ash, Surrey (leg. Beeby). I have seen it from Shirley, Derbyshire (leg. W. R. Linton).

E. (MONTANUM × ROSEUM) × ROSEUM. One specimen only, near Worplesdon, which I had queried as "*montanum* × *roseum*, ad *roseum* vergens."

E. MONTANUM × ROSEUM × PARVIFLORUM. From the same locality as the last. Two plants were found, one of which I have in cultivation. They completely puzzled me, as there seemed to be clear traces of both *montanum* and *parviflorum*, while yet the general habit was nearer *roseum* than either. At Prof. Haussknecht's suggestion, I will attempt to describe this form:—Plant two feet high or more, branched from below the middle. Stem terete, with two very faint pubescent lines, nearly glabrous. Leaves all distinctly petioled, slightly but regularly sinuate-denticulate, somewhat rounded at the base, lanceolate or oblong-lanceolate, subacute, glabrous on both sides; lower opposite, upper alternate. Buds pubescent, erect, subapiculate. Petals $\frac{1}{5}$ in. long, very pale pink, becoming rosy. Stigmas clavate, but rudimentarily four-lobed. Capsules extremely slender, $1\frac{1}{2}$–2 in. long. Seeds undeveloped and shrivelled. [The form of *parviflorum* in this locality is glabrescent, so that the same thing is natural in its offspring].

E. (OBSCURUM × PALUSTRE) × OBSCURUM. Sandy ride in a fir-plantation near Tilford; several plants (the same station where I found *palustre* × *parviflorum* in 1888). These I had thought might be *Lamyi* × *palustre*, but further study does not encourage that theory; nor do they quite match such specimens of simple *obscurum* × *palustre* as I have seen. On the other hand, there is no trace of any different species, and the stigmas are clavate. They have deep-green leaves, bright rose-coloured flowers, expanding more than is usual in *obscurum;* and the young capsules are ashy-white with appressed down. Roughly speaking, they are much like what one would expect to result from the suggested combination.

MARINE ALGÆ OF THE ARBROATH DISTRICT.

By James Jack.

The district is bounded by Arbroath Bay (including it) on the south, and extends to the crumbling rock beyond the sandstone and conglomerate of the Red Head. The locality has been by no means well examined, but the following plants collected are the result of a paper contributed to the Arbroath Natural History Association, the practical work being done during the past summer months. The classification and nomenclature adopted in the following list are taken from Harvey's 'Phycologia Britannica,' as being the work at the present time most generally referred to.

Halidrys siliquosa Lyngb. Common in all pools about half-tide level.

Fucus vesiculosus L. Abundant on all low-lying rocks exposed above low water.—*F. serratus* L. Common on rocks between tide-marks.—*F. nodosus* L. (*Ascophyllum nodosum* Le Jolis). Common, generally growing in patches on boulders.—*F. canaliculatus* L. (*Pelvetia canaliculata* Decne. & Thur.). Common on rocks above half-tide level, and exposed for several hours daily. N.B.—The growth of Fuci is not so abundant on the old red sandstone as among the boulders of the conglomerate.

Himanthalia lorea Lyngb. Common on all exposed rocks at low water.

Desmarestia aculeata Lamour. Common, washed ashore in abundance from deep water after storms.

Alaria esculenta Grev. Plentiful about low-water mark on exposed rocks to the east of Arbroath.

Laminaria digitata Lamour. (*L. hyperborea* Foslie). Abundant everywhere from below low-water mark.—*L. digitata* var. *stenophylla* Harv. = *L. digitata* Edm. — *L. saccharina* Lamour. Common in pools near low water. — *L. Phyllitis* Lamour (*L. saccharina* var. *phyllitis* Le Jolis.). In pools below half-tide level, abundant to west of Harbour. — *L. Fascia* Ag. (*Phyllitis Fascia* Le Jolis). In half-tide pool below Seaforth House. — Var. *debilis* (*Phyllitis cæspitosa* Le Jolis). Common. — *L. flexicaulis* Le Jolis. Common at low water about the Harbour Bar.

Chorda Filum Lamour. Large plants washed ashore occasionally; young are found growing in deep pools all round the cliffs, where the force of the sea is broken by outlying rocks. — *C. lomentaria* Lyngb. (*Scytosiphon lomentarius* J. Ag.). Not uncommon in pools between tide-marks; plentiful below. Plentiful on beach inside of salmon-nets at Cannon Common.

Dictyosiphon Chordaria Areschoug. The first record of this species in Britain. Detected by Mr. Holmes amongst some Algæ collected by me at Whiting Ness, Arbroath, on 29th August, 1889, and exhibited at the Linnean Society on November 7th. — *D. fœniculaceus* Grev. Abundant above half-tide, generally submerged, and growing on other Algæ.—*D. hippuroides* Aresch. Plentiful, growing on *Chordaria flagelliformis* at the Ness, in pools about half-tide level.

Punctaria plantaginea Grev. At the Mason's Cove, according to Dr. Crichton.

Asperococcus echinatus Grev. Abundant in all pools near high-water mark.

Litosiphon Laminariæ Harv. Common on *Alaria esculenta.*

Chordaria flagelliformis Ag. Common about half-tide level. At the point of the Ness all the plants are more or less covered with *Dictyosiphon hippuroides.*

Mesogloia virescens Carm. (*Eudesme virescens* J. G. Ag.). Found in one or two pools beyond Steeple Rock, and at Mason's Cove, above half-tide level.

Leathesia tuberiformis S. F. Gray. Very common on rocks about low-water mark.

Elachista fucicola Fries. Common on most Fuci about half-tide. — *E. velutina* Duby. (*Streblonema velutina* Thur.). Common on *Himanthalia.*

Myrionema strangulans Grev. Rare. Found on *Enteromorphæ* near high water, in a pool at Stalactite Cave.

Cladostephus spongiosus Ag. Abundant at low-water mark below Seaforth House and East Links. — *C. verticillatus* Ag. Found in 1883 by Mr. Bell, at Dark Cove, floating?

Chætopteris plumosa Ktz. (*Cladostephus plumosus* Holmes). Very rare. Two specimens got in a pool at the Corriens.

Sphacelaria scoparia Lyngb. Abundant in a deep pool beyond

Gaylet pot, at high-water mark.—*S. cirrhosa* Ag. Common, generally on other Algæ. At the Mason's Cove, *Delesseria sanguinea* is always more or less infested.—*S. radicans* Harvey. At the Mason's Cove, common; and Corriens, not uncommon. On the sides of Fuci-covered sand-rock, and in shallow pools about low water.—Var. *olivacea* Batters. In caves, forming matted tufts.

Ectocarpus siliculosus Lyngb. (*E. confervoides* Le Jolis). Abundant on Fuci between tide-marks.—*E. fasciculatus* Harvey. On the edges of the fronds of *Laminariæ* at the Ness and Floors Bay.—*E. tomentosus* Lyngb. Very abundant at different parts of the cliffs, old thongs of *Himanthalia lorea* being clothed with a dense ropy mass, giving a bottle-brush appearance to it; also found on the Fuci.—*E. littoralis* Lyngb. (*Pylaiella littoralis* Kjellm.). Common in all tide-pools on Fuci. Inside of breakwater, on muddy rocks, found with unilocular sporangia.—*E. granulosus* Ag. Found once below Signal Tower, in a half-tide pool. — *E. sphærophorus* Carm. (*Isthmoplea sphærophora* Kjellm.). In a deep gully at the Steeple Rock, on *Ptilota sericea;* and at Auchmithie, on *Polysiphonia nigresens.* Rare.

Ascocyclus balticus Reinke. On *Laminaria* at Mason's Cove.

Myriotrichia clavæformis Harv. On *Polysiphonia nigrescens*, in a pool beyond the Ness, at high-water mark. — *M. filiformis* Harvey. Growing in the same pool as the preceding, and epiphytic on the same plant.

Odonthalia dentata Lyngb. Plentiful at the Cliffs; large specimens more than a foot long washed ashore from deep water.

Rhodomela lycopodioides Ag. In pools to west and east of Harbour, at extreme low water; epiphytic. Rare. — *R. subfusca* Ag. Common at low-water mark in pools below Arbroath.

Polysiphonia urceolata Grev. Abundant on *Laminaria digitata*, and on rocks at low water. At the Red Head it grows very abundantly on a rock connecting the Old Red Sandstone and Basaltic, the plants forming tufts ten inches long. — *P. fibrata* Harv. At Whiting Ness, on exposed rocks. — *P. elongata* Grev. Below East Links, and washed ashore at West Sands from deep water. Rare. — *P. Brodiæi* Grev. Common on rocks and pools from below half-tide.—*P. nigrescens* Grev. Plentiful everywhere.—*P. atrorubescens* Grev. In a sandy pool on the Harbour Bar, and Mason's Cove.—*P. fastigiata* Grev. Plentiful on *Fucus nodosus*.—*P. parasitica* Grev. On *Laminaria digitata* from Bell Rock, and in rock-pools at the Mason's Cove. — *P. byssoides* Grev. Cast ashore in abundance at the West Sands.

Laurencia pinnatifida Lamour. Common at low-water mark.—*L. cæspitosa* Lamour. (*L. hybrida* Lenorm.). Common in rock-pools near high-water mark.

Chrysymenia clavellosa J. Ag. (*Chylocladia clavellosa* Grev.). Washed ashore in abundance; found growing at Deil's Head at extreme low water.

Chylocladia articulata Grev. (*Lomentaria articulata* Lyngb.). Abundant in gullies and shaded sides of rocks.

Peyssonnelia Dubyi. On *Laminaria* stems, with tetraspores, in November.

Hapalidium hildenbrandtioides, Crn. On stems of *Furcellaria*.

Corallina officinalis L. Very common in tide-pools.

Melobesia polymorpha L., sp. (*Lithothamnion polymorphum* J. Ag.). Common in pools and on rocks. Limpet-shells at the Red Head found with very irregular lobes. — *M. Lenormandi* Aresch. (*Lithophyllum Lenormandi* Rosanoff). On stones and boulders between tide-marks at East Links. — *M. Laminariæ* Cr. On stems of *Laminaria*. — *M. farinosa* Lamour. On *Phyllophora rubens* at Mason's Cove. — *M. pustulata* Lamour. Abundant on *Laminaria*-stems and roots.

Hildenbrandtia rubra Menegh. (*H. prototypus* Nardo, var. *β. rosea* Hauck.). On stones and boulders everywhere, and in pools between tide-marks.

Delesseria sanguinea Lamour. (*Hydrolapathum sanguineum* Stackh.) Common in pools at extreme low-water mark all round the cliffs; washed ashore at West Sands in abundance. — *D. sinuosa* Lamour. Common on *Laminaria*-stems which are washed ashore from deep water. — *D. alata* Lamour. Common on *Laminaria*-stems, and in rock-pools at extreme low water. — *D. Hypoglossum* Ag. Found by Dr. Crichton. Rare.

Nitophyllum punctatum Grev. Found six plants growing at extreme low-water mark on a boulder, in fruit, August, 1888. Very rare.—*N. laceratum* Grev. Cast ashore on West Sands, *Dr. Crichton.*

Plocamium coccineum Lyngb. Common at low water (spring-tides), and washed ashore in great abundance. A broad and a narrow-leaved variety are found.

Rhodymenia laciniata Grev. (*Callophyllis laciniata* Ktz.). One specimen washed ashore at sands. — *R. palmata* Grev. Grows in great profusion all round the coast from half-tide downwards. At the Bell Rock, stems of *Laminaria* are covered with specimens twenty inches long.

Hypnea purpurascens Harv. (*Cystoclonium purpurascens* Ktz.). Common in pools about low water.

Gigartina mammillosa J. Ag. Growing abundantly on outside of Protection Wall and Breakwater, but common everywhere.

Chondrus crispus Stackh. Common about low-water mark; both narrow and broad-leaved varieties occur.

Phyllophora rubens Grev. Common in pools at extreme low water at Mason's Cove; washed ashore abundantly after autumn storms. — *P. membranifolia* J. Ag. Plentiful at low-water mark; some very large plants washed ashore at the Harbour in October, 1888.

Gymnogongrus plicatus Kg. (*Ahnfeltia plicata* J. Ag.). Occasionally in sand-pools about low-water mark from Ness to the Common.

Polyides rotundus Grev. Not uncommon in pools at low water, in same situations as *Furcellaria fastigiata*.

Furcellaria fastigiata Grev. (*Fastigiaria furcellata* Stackh.). In pools about low-water mark. At West Sands, washed ashore in abundance.

Dumontia filiformis Grev. Very plentiful from the Ness to the Common in all pools about half-tide level.

Iridea edulis Bory (*Schizymenia edulis* J. Ag.). On rocks at low water, and in deep pools. Some very large specimens washed ashore from deep water at West Sands.

Catenella opuntia Grev. At the Dark Cave and Breakwater near high-water mark.

Cruoria pellita Harv. (*Petrocelis cruenta* J. Ag.). On rocks. "Your plant has a basal layer like *P. Middendorffii* Ruprecht, but is not in fruit," *E. M. H.*

Gloiosiphonia capillaris Carm. Growing at Auchmithie, *Dr. Crichton.*

Ptilota plumosa Ag. In abundance on stems of old *Laminariæ* washed ashore, occasionally growing at low-water mark; with tetrasporic fruit at Red Head. — *P. sericea* Gmel. Common on the shaded sides of gullies and rocks at Steeple Rock, Mason's Cove, Red Head, &c.

Ceramium rubrum Ag. Common all round the coast, between tide-marks. — *C. botryocarpum* Griff. (*C. rubrum* Ag., var.). In summer of 1884, *Dr. Crichton ?*— *C. Deslongchampsii* Chauv. Epiphytic on other Algæ, *Dr. Crichton.*—*C. diaphanum* Roth. Common on Fuci and other Algæ near high water in pools.—*C. acanthonotum* Carm. Common from below half-tide on all parts of the rocks, but seems, however, to prefer the protected sides.

Griffithsia setacea Ag. In shaded pools at Mason's Cove and Deil's Head.

Callithamnion plumula Lyngb. (*Antithamnion plumula* Thur.). At the Ness and Mason's Cove in 1884, *Bell.* — *C. Turneri* Ag. (*Spermothamnion Turneri* Aresch.). From below half-tide to low water; usually epiphytic on *Ptilota sericea* at the Mason's Cove and Auchmithie.—*C. arbuscula* Lyngb. Common on mussels and rocks about low-water mark. Very fine specimens at Dickmont's Den.— *C. Brodiæi* Harv. Common on rocks all round the low-water mark opposite Arbroath. — *C. Hookeri* Ag. Generally on *Cladostephus spongiosus* and on rocks at low water, Steeple Rock, and below West Ropeworks. — *C. polyspermum* Ag. Common at half-tide level on protected sides of rocks. In Outer Harbour, opposite Signal Tower, very abundant. — *C. spongiosum* Harv. (*C. granulatum* Ag.). Rare. At the Red Head low-water mark. Epiphytic on smaller Algæ.— *C. floridulum* Ag. (*Rhodochorton floridulum* Näg.). Common in sandy pools at the Corriens. Occasionally at the cliffs on soft sandy rocks.— *C. Rothii* Lyngb. (*Rhodochorton Rothii* Näg.). Common on rocks near high-water mark. A small cove immediately to the west of Mason's Cove is entirely lined with this plant. — *C. virgatulum* Harv. (*Chantransia virgatula* Thur.). On *Polysiphonia urceolata* at the Red Head, on rocks below low-water mark.

Bryopsis plumosa Ag. Rare. In pools at the Mason's Cove and Auchmithie, growing on the sides in the shade.

Cladophora rupestris Kg. Common between tide-marks, generally on exposed rocks. — *C. lætevirens* Harv. In pools above half-tide level. Not uncommon. — *C. albida* Kutz. In a pool near high-water mark at Red Head. Very rare. — *C. arcta* Kütz. Common on rocks and in pools about low water.

Conferva tortuosa Dillw. (*Chætomorpha tortuosa* J. Ag.). Abundant on Algæ in high-water mark pools. — *C. Melagonium* Web. et Mohr. (*Chaetomorpha Melagonium* Kütz.). Intermittent in its habit of growth. Not uncommon at Mason's Cove, Steeple Rock, and Breakwater. — *C. Youngana* Dillw. (*Ulothrix isogona* Thur.). On *Fucus vesiculosus* and rocks near high-water mark. The outside of Breakwater is fringed with this plant.

Enteromorpha intestinalis Link (*Ulva Enteromorpha* Le Jolis, var.). Abundant in most pools near high-water mark. A large supply of water finds its way to the sea all round Arbroath, appearing as springs dotted everywhere; this will account for the large growths of this plant as found at the Ness and Common. — *E. compressa* Grev. (*Ulva Enteromorpha* Le Jolis, var.). Common on rocks and stones everywhere. At the West Sands the Algæ about low-water mark are always more or less covered. — *E. clathrata* J. Ag. On *Ceramium rubrum* at Red Head. Not uncommon.

Ulva latissima L. (*Ulva lactuca* L.). Common in tide-pools, and on rocks and stones.—*U. Linza* L. (*Ulva Enteromorpha* Le Jolis, var.). Common in most half-tide pools.

Porphyra laciniata Ag. Common between tide-marks on rocks, and epiphytic on Algæ. The form *umbilicalis* also occurs.—*P. vulgaris* Ag. Common on rocks, and in almost all pools above and below half-tide level. — *P. leucosticta* Thuret. Growing on Algæ near low-water mark.

Rivularia atra Roth. Common on Algæ in pools near high-water mark. At Auchmithie, Red Head, Mason's Cove, &c.

Calothrix confervicola Ag. Epiphytic on Algæ. Not uncommon.

Lyngbya Carmichaelii Harv. (*Ulothrix flacca* Thur.). Abundant on *Fucus vesiculosus* above half-tide level from Ness to the Common.

Dermocarpa incrustans Holmes MSS. (*Sphænosiphon incrustans* Reinsch). Parasitical on *Polysiphonia*. Mr. Holmes thinks it may possibly be only a variety of *D. prasina*; but the fronds are narrower and more cylindrical than in that species, and correspond exactly with Reinsch's figure. He has not met with fronds intermediate in character.

In conclusion, I take this opportunity of expressing my thanks to Mr. Holmes for the assistance rendered me in the identification of species, and the synonymy at present in general use.

SYNOPSIS OF GENERA AND SPECIES OF *MALVEÆ*.

By Edmund G. Baker, F.L.S.

There are few orders of which a general monograph is more needed than *Malvaceæ*. The last complete enumeration was that of DeCandolle in the first volume of the 'Prodromus' in 1824, and during the sixty-five years that have elapsed a very large number of additional species have been described. In the present paper I propose to attempt to bring together those belonging to the first tribe *Malveæ*, and briefly characterise them. In the arrangement and limitation of the genera I have followed Bentham and Hooker's 'Genera Plantarum,' with very slight alteration.

Tribe I. *MALVEÆ.*—Columna staminea apice v. usque ad apicem antherifera. Styli rami tot quot ovarii loculi v. carpella. Cotyledones foliaceæ, biplicatæ v. varie contortuplicatæ.

Subtribe 1.—Carpella ∞ inordinate capitato-congesta; ovula solitaria adscendentia.

I. MALOPE L. Gen. Pl. n. 843.—Bracteolæ 3 distinctæ. Styli filiformes intus longitudinaliter stigmatosi.

* *Annua.*

1. Malope trifida Cav.; DC. Prod. i. 429; Sweet, Brit. Fl. Garden, t. 153; Paxt. Mag. Bot. vol. i. p. 177 c. icon.—Stipulis parvis, foliis glabris inferioribus suborbicularibus apice trilobatis trinerviis, pedicellis solitariis, bracteolis magnis cordatis cuspidatis, sepalis ovatis acuminatis.

Hab. Andalusia (Spain)! Algiers! Morocco.

Stem 12–18 in. high, branching; branches spreading; leaves 2½ in.; bracts ¾ in. long; sepals 1¼ in.; petals 1¼–1¾ in. long.

** *Perennes.*

2. M. malacoides L.; DC. Prod. 1, 429; Rchb. Ic. Flor. Germ. v. t. 165; Bot. Mag. t. 5852. *M. althæoides* Moris in Rchb. Fl. Exc. p. 873.—Stipulis parvis oblongo-linearibus, foliis inferioribus petiolatis elliptico-oblongis vel subpinnatifidis parce pilosis basi cuneatis vel subcordatis crenulatis, pedunculis solitariis, bracteolis parvis, sepalis valde acuminatis.

Hab. Mediterranean Region. Marocco to Asia Minor!

Subsp. M. stipulacea Cav.; DC. Prod. i. 429. *M. asterotricha* & *M. lævigata* Pomel. Fl. Atlantique, p. 346. *M. hispida*, *M. stellipilis*, & *M. tripartita* Boiss. et Reut. in Boiss. Diagn. Pl. Or. iii. p. 100. *M. intermedia* Battandier, Fl. de l'Algerie, p. 110. *M. malacoides* var. *stipulacea* Ball in Journ. Linn. Soc. xvi. p. 375. *M. stellaris* B. et R. in Willkomm et Lange, Fl. Hisp. iii. p. 587 = *M. stellipilis.*—Stipulis magnis cordatis, foliis elliptico-oblongis vel ovatis vel trilobis interdum cordatis.

Hab. Algiers! Marocco! Cadiz (Spain)!

Stems 1–2 ft. long, prostrate or ascending; leaves 1–2½ in. long, ½ in. broad; sepals nearly ¾ in.; petals 1 in. to nearly 2 in. long.

M. hispida and *stellipilis* are robust forms, more densely hairy upwards than in typical *M. stipulacea*. *M. malacoides* var. *sinuata* DC. is an intermediate form between *M. stipulacea* and M. *malacoides*, with subtrifid leaves. For the characters of the other forms, reference may be made to Battandier, Fl. de l'Algerie, p. 110.

Non satis nota.

M. multiflora Trigueros in Cav. Diss. ii. p. 85; DC. Prod. i. 430.—"Foliis subrotundis crenatis villosis: floribus 3–4 axillaribus."

Hab. In Andalusia; not seen by Willkomm and Lange.

Plantæ exclusæ.

M. parviflora L'Heritier = *Palaua malvæfolia* Cav.

M. indica Wight ex Walp. is a blunder in transcribing for *Melicope indica* Wight.

II. KITAIBELIA Willd. in Neue Schr. Nat. Fr. Berl. ii. 107. —Bracteolæ 6–9 basi connatæ. Styli apice stigmatosi.

1. Kitaibelia vitifolia Willd. *l. c.;* DC. i. 436; Bot. Mag. t. 821; Rchb. Ic. Fl. Germ. v. t. 165.—Stipulis ovato-acutis, foliis petiolatis 3–5 palmitifidis glabris lobis acutis biserratis basi cordatis, involucro calycem excedente, floribus axillaribus solitariis vel geminis, corollis albis.

Hab. Hungary! Croatia!

Stems 4–6 ft. high; leaves 3–6 in.; bracts ⅔ in. long; sepals ½ in. long; petals 1 in. long, obcordate.

2. K. Balansæ Boiss. Fl. Or. i. 817. — Stipulis lanceolatis, foliis e basi truncata subæquilateraliter triangularibus acute dentatis, bracteolis lanceolatis acutis basi fere liberis laciniis calycis lanceolatis subbrevioribus, corollis roseis.

Hab. Cilicia, *Balansa.*

According to Boissier, this plant differs from *K. vitifolia* in the shape of the leaves, stipules, and bracts. The carpels are white and hirsute. In his diagnosis of the genus *Kitaibelia* (Fl. Or. i. 817) Boissier describes the styles as longitudinally stigmatose.

III. PALAUA Cav. Diss. 40, t. 11, f. 4, 5 (1785), non Ruiz et Pavon. *Palava* Juss. Gen. Plant. p. 271 (1789); Benth. et Hook. fil. Gen. Plant. i. 200. *Palavia* Schreb. Gen. ii. p. 464 (1791).—Bracteolæ 0. Styli filiformes apice stigmatosi.

* *Perennis.*

1. Palaua moschata Cav.; DC. Prod. i. 458. *Palavia prostrata* Hort.; Loud. Hort. Brit. i. p. 290. — Stipulis lanceolatis nigrescentibus, foliis pannosis ovatis lobatis obtusis crenatis basi cordatis, pedicellis 1-floribus, calycis magnis pannosis sepalis cordatis apice acutis.

Hab. Chili! Peru, nr. Lima!

A perennial; leaves 2 in. long, 1½ in. broad; stipules ⅙ in.; sepals ⅔ in.; petals 1 in. long, purple.

** *Annuæ.*

2. P. malvæfolia Cav.; DC. Prod. i. 458. *Malope parviflora* L'Heritier. *Palava declinata* Moench. *Palavia rhombifolia* Grah. in Edin. Phil. Journ. 1830, p. 369; Bot. Reg. t. 1375; Bot. Mag. t. 3100. — Caulibus elongatis sursum pilosis, foliis membranaceis rhomboideis inferioribus orbicularibus sinuatis floribus solitariis sepalis late ovatis cuspidatis.

Hab. Chili! Peru!

An annual. Leaves 1–2 in. long, 1½ in. broad; stipules ⅕ in.; sepals ¼ in.; petals ⅔ in. long, rose-coloured.

3. P. DISSECTA Benth. in Journ. Linn. Soc. vi. 101 (*Palava*). *Palava flexuosa* Mast. in Gard. Chron. 1866, p. 435; Bot. Mag. t. 5768; Regel, Gartenflora, taf. 647. — Caule prostrato superne flexuoso, foliis radicalibus oblongo-ovatis, caulinis profunde bipinnatifidis dissectisve lobis cuneato-oblongis obtusis, sepalis late ovatis acutis, carpellis oblique obovatis rugoso-reticulatis.

Hab. Peru, *Maclean*! Chili!

Stems 8–10 in. long; leaves 1–2 in. long, 1 in. broad; calyx ⅛ in.; petals ½ in. long. This plant was introduced into cultivation by Messrs. Veitch in 1866.

CYPERUS JEMINICUS Rottb.

By C. B. Clarke. F.R.S.

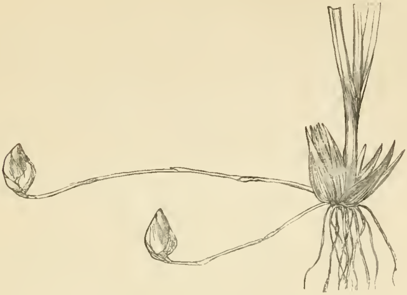
My attention has only lately been drawn to a paper by Dr. Trimen in Journ. Bot. 1884, p. 358, criticizing my account of *C. Jeminicus* Rottb. He makes three principal animadversions upon me, *viz.*:—

(1.) There is no sufficient proof that the plant in question is *C. Jeminicus* Rottb., and therefore the name *C. bulbosus* Vahl, has priority.

(2.) Each individual is as strictly an annual as other proliferous bulbous plants, and its mode of growth is entirely different from that of *C. usitatus* Burchell, *C. stoloniferus* Retz., and others.

(3.) The figures of C. B. Clarke in Journ. Linn. Soc. v. 21, t. 2, figs. 17, 18, said to represent the rhizome of *C. Jeminicus*, are wrong (Dr. Trimen is at a loss to guess what is intended by them).

To these I would reply *seriatim*, as follows:—First, our plant grows in Arabia; Roxburgh referred the Indian *bulbosus* to it; and if the plant of Rottboell is not the Indian plant, nobody pretends to say what it is. Dr. Trimen says generally, that neither Rottboell's description nor his figure agrees well with our plant. I think that *C. Jeminicus* is as certainly identified as most names of the older authors where we have not got the specimen they figured or described. Secondly, there are slender stolons, sometimes as much as four inches long; on these are produced the "bulbils," very commonly in clusters of two or three; these produce culms just as in the allied species, but usually in succession, so that in the dried specimens we have frequently a culm nude at base, because its own scales have fallen away, but with a bulbil close to it often touching it. Sometimes, however, two closely touching bulbils produce simultaneous culms. The manner of growth is *exactly* as that of *C. usitatus* Burchell; indeed, as I implied in my paper, I have difficulty in separating the two species. In *C. usitatus* the stolon is stouter, the bulbil larger, and the bulbil producing the culm is usually a little remote from the next (still in the bulbil condition). Thirdly, I have got Mr. C. Fitch to make a drawing, herewith appended, of the stolons, bulbils and culm base



from the ample Kew material. My old pictures in the 'Linnean Journal,' v. 21, t. 2, figs. 17, 18, are entirely diagrammatic; t. 18, seen by comparing with Mr. Fitch's figure, shews the common state of *C. Jeminicus*; t. 17 represents perhaps rather *C. usitatus* Burchell; but I observe that a specimen in this herbarium from Uganda (said to be *C. vestitus* Hochst. in 'Flora,' 1845, p. 755), which I formerly referred to *C. Jeminicus*, is perhaps *C. usitatus* Burchell. Except in the delicacy of the stolons, I still do not quite understand how *C. Jeminicus* differs in its manner of growth from some of its neighbours.

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.

By James Britten, F.L.S., and G. S. Boulger, F.L.S.

(Continued from p. 375.)

Mitchell, Anna Helena (1794–1882): b. Gothenburg, Sweden, 22nd May, 1794; d. Montrose, Forfarsh., 14th Jan. 1882; bur. St. Peter's Episcopal Churchyard, Montrose. Marine zoologist, lichenologist, and algologist. Worked with Gilchrist and Croall. Herbarium in possession of her nephew, James Keogh, Exeter. Duplicates in Montrose Museum.

Mitchell, James (fl. 1833). R.N. Described *Mentha crispa* for Eng. Bot. t. 2785.

Mitchell, John (d. 1772). M.D. F.R.S. Of London. In Virginia, c. 1700-1748. Correspondent of Linnæus. 'De Principiis Botanicorum,' 1769. 'Nova Pl. Genera,' 1741. Pult. ii. 278; Letters in Linn. Corresp. ii. 442; Pritz. 219; Jacks. 206; Darlington, Memorials of Bartram, 363; Allibone. *Mitchella* L.

Mitchell, John (fl. 1827). Of Stanstead, Sussex, and Keighley, Yorks. 'Dendrologia,' 1827.

Mitchell, Sir Thomas Livingstone (1792–1855): b. Craigend, Stirling, 1792; d. Sydney, 5th Oct. 1855. Lieut.-Col. R.A. Surveyor-general, N.S.W. D.C.L., Oxon., 1839. F.R.S., 1839. Knighted, 1839. 'Expeditions into Eastern Australia' (1831–1836), 1838. Plants presented to Brit. Mus., also in Hb. Kew. Pritz. 219; Lasègue, 497; Woolls, Progress Bot. Discovery in Australia (1869), 23; Fl. Tasm. cxx.; Allibone. Mem. and portr. Illustr. London News, 1855. *Capparis Mitchellii* Lindl.

Mitchell, William (d. 1873): d. Edinburgh, 10th April, 1873. Ass. Bot. Soc. Edinb., 1858. City Missionary. Papers in Trans. Bot. Soc. Edinb. vi. and x., on Internodes, &c. R. S. C. iv. 410; viii. 411; Trans. Bot. Soc. Edinb. xii. 29.

Mitford, —. (fl. 1806). Sent Surinam plants to Rudge.

Moggridge, John Traherne (1842–1874): b. Woodfield, Monmouth, 8th March, 1842; d. Mentone, 24th Nov. 1874. F.L.S., 1869. Son of the following. Grandson of L. W. Dillwyn. 'Flora of Mentone,' 1867. Plants at Kew. Pritz. 220; Jacks. 581; Proc. Linn. Soc. 1874–78, lxi.; R. S. C. viii. 415; Journ. Bot. 1875, 63; Gard. Chron. 1874, ii. 723.

Moggridge, Matthew (1803–1882): b. 16th July, 1803; d. Kensington, 14th July, 1882. F.L.S., 1877. Son-in-law of L. W. Dillwyn. Collected plants for 'Fl. of Mentone.' Proc. Linn. Soc. 1882–83, 42; R. S. C. iv. 421; viii. 416.

Molloy, Mrs. (fl. 1855). Of Swan River Colony. Sent plants to Kew. Journ. Bot. 1855, 382. *Molloya* Meisn. = *Grevillea.*

Molyneux, Sir Thomas (c. 1660–1733): b. Dublin ?, circ. 1660; 19th Oct. 1733. "Physician to the State." B.A., Dublin, 1680. M.D., 1687. F.R.S. Professor of Physic, Dublin University. Senior Physician to the Forces. Bart. Appendix to Threlkeld's 'Synopsis' (pp. 22), 1727. Pult. ii. 196; Hœfer.; Michaud.

Monson, Lady Ann (d. before 1819). Botanised at the Cape with Thunberg and Masson, and also in India. Helped Lee in his 'Introduction.' Thunberg, Fl. Cap. 7; Rees, s. v. *Monsonia. Monsonia* L.

Montgomery, J. (fl. 1837). Cat. Renfrewshire plants in N. Bot. Guide, 417 (1837). Top. Bot. 550.

Moon, Alexander (d. 1825). Superintendent, Ceylon Bot. Garden, 1817–1825. 'Catalogue of Ceylon Plants,' 1824. Drawings in Bot. Dept., Brit. Mus. Pritz. 223; Jacks. 395. *Moonia* Arn. = *Chrysogonum.*

Moorcroft, William (d. 1825): b. Lancashire; d. Andhko, Afghanistan, 27th Aug. 1825; bur. Balkh. Veterinary Surgeon. Inspector of Cavalry horses to H.E.I.C. In India from 1808. Collected and travelled with Wallich in Nepal. Travelled in N.W. India, &c., 1819–1825. 'Travels' [with George Trebeck], ed. H. H. Wilson, 1841, with biog. R. S. C. iv. 455; Hœfer. *Moorcroftia* Chois. = *Lettsomia.*

Moore, David (1807–1879): b. Dundee, 1807; d. Glasnevin, Dublin, 9th June, 1879. Ph.D., Zurich, 1863. A.L.S., 1840. F.L.S., 1861. Botanist to Ordnance Survey of Ireland, 1834. Director of Royal Gard., Glasnevin, 1838. 'Botany of Londonderry,' 1837. 'Brit. Grasses,' 1850. 'Cybele Hibernica' [with A. G. More], 1866. 'Synopsis of Irish Mosses,' 1873. Irish plants at Glasnevin. Pritz. 223; Jacks. 582; R. S. C. iv. 456; viii. 430; Journ. Bot. 1879, 224; Gard. Chron., with portr., 1871, 739; 1879, i. 757; 'Garden,' with portr., xiii. 1878; Trans. Bot. Soc. Edinb. xiv. 37. Portr. at Kew. *Isoetes Moorei.*

Moore, Oswald Allen (d. before 1863). Of York. MS. Fl. of Yorkshire, 'Top. Bot.' 550. Brit. Assoc. Report, 1844 (Notices), 70; R. S, C. iv. 458; Mag. Nat. Hist. iv. (1840), 327; Baker's 'N. Yorkshire,' 343.

Moore, Thomas (1821–1887): b. near Guildford, Surrey, 21st May, 1821; d. Chelsea, 1st Jan. 1887. F.L.S., 1851. Gardener, Regent's Park. Curator, Chelsea Bot. Gard., 1848. Editor of 'Gardener's Mag.' 1850–51; of 'Garden Companion,' 1852; of 'Floral Mag.,' 1861; of 'Gard. Chron.,' 1866–1882; of 'Florist and Pomologist,' 1868–1874; of 'Orchid Album,' 1881–1887. 'British Ferns,' 1851. 'Brit. Wild Flowers,' 1867. Pritz. 223; Jacks. 582; R. S. C. iv. 458; viii. 432; Journ. Bot. 1887, 63; Ann. Bot. 1888, 409, with bibliog.; Gard. Chron. 1882, i. 709; 1887, i. 48, with portr.

Moore, T (fl. 1718–1724). "The Pilgrim Botanist." Went to New England, 1722–24. Rich. Corr. 181, 206.

Morgan, Edward (fl. 1660–1686?). Of "the medical garden at Westminster"; "a skilful botanist," 'Evelyn's Diary,' 1658. "Viro in rebus Botanicis haud infimæ notæ accepimus," Pluk. Alm. p. 191. Herb. Sloane, 83 (also 24–26?); Pluk. Alm. 114; Loudon, 'Arboretum,' 50, 74.

Morgan, Hugh (fl. 1569). Apothecary to Queen Elizabeth. Had a bot. garden. Introduced *Clematis Viticella*, 1569, and other plants. Ger. Herbal; Lobel, 'Adversaria,' 294, 343, 493. *Morgania* Br.

Morgan, Thomas Owen (fl. 1848–1869). Of Aberystwith. 'Flora Cereticæ superioris,' 1849. Jacks. 248.

Moriarty, Henrietta Maria (Mrs.). (fl. 1803–1812). Novelist. 'Viridarium,' 1803 (coloured plates, with names and cultural notes). Jacks. 407.

Morison, Robert (1620–1683): b. Aberdeen, 1620; d. London, 9th Nov. 1683. Ph.D., Aberdeen, 1638. F.R.C.P. M.D., Angers, 1648. Superintendent of Duke of Orleans' Gard., Blois, till 1660. Keeper of Physic Garden, Oxford, 1669. 'Hortus Regius Blesensis auctus,' 1669. 'Præludia Botanica,' 1669. 'Umbelliferarum Distributio,' 1672. 'Plantarum Historiæ . . . Oxoniensis, pars 2,' 1680, with life by Bobart or Hearne [see Ayscough, 31989, 9], and portr. engr. by R. White, after Sunman. Pult. i. 298; Rees; Pritz. 225; Jacks. 583; Wood, Fasti, ii. 178; Rich. Corr. 34; Franchet, Fl. Loire, pref. Oil-painting at Oxford Bot. Gard. *Morisonia* Plumier.

Morland, Sir Samuel (c. 1625–1695): b. Sulhamstead, Reading, Berks., circ. 1625; d. Hammersmith, 30th Dec. 1695. Bart.,

1660. Master of Mechanics to Charles II. 'Parts and Use of the Flower,' Phil. Trans. xxiii. 1474. Pult. i. 339; Pritz. 225; Autobiog. in MS. at Lambeth Palace; Rose; Hæfer; Chalmers.

Morley, Christopher Love (fl. 1676–1702). M.D., Leyden, 1679. F.R.C.P., 1686. Herb. of plants from Leyden and Paris gardens in Herb. Sloane, 78* Munk, i. 450.

Morris, John (1810–1886): b. Homerton, 19th Feb. 1810; d. St. John's Wood, 7th Jan. 1886; bur. Kensal Green Cemetery. Hon. M.A., Camb., 1878. F.G.S., 1845. Prof. Geology, Univ. Coll., 1855–1877. 'Catalogue of Fossil Plants of Britain,' Mag. Nat. Hist. 1839. 'Recent and Fossil Cycadeæ,' Ann. & Mag. 1841, 110. 'Coal-plants,' Proc. Geol. Assoc. i. 'Cretaceous Flora,' Pop. Sci. Rev. xv. 'Fossil Fl. of Rajmahal.' Jacks. 583; R. S. C. iv. 485; Journ. Bot. 1886, 64; Geol. Mag. 1878, 481, with portr.; Proc. Geol. Soc. 1885–86, 44.

Morris, Richard (fl. 1820–1830). F.L.S., 1825. Surveyor and Landscape Gardener. 'Botanist's Manual,' 1824. 'Flora Conspicua,' 1825–6. Pritz. 226; Jacks. 407.

Morris, William (d. 1764): d. Holyhead, 1764. Comptroller of Customs at Holyhead. MS. 'Collection of pl. gathered in Anglesey.' "A good practical botanist." Davies,' 'Welsh Botanology,' vii. MS. Notes in a copy of Ray's 'Synopsis,' ed. 1724, in Bibl. Mus. Brit., press-mark 872, k. 27. Rose.

Morrison, William (fl. 1828). Gardener. Taken to Swan River by Governor Stirling, 1828. Sent collections to England for sale. Smith, Kew, 11.

(To be continued.)

SHORT NOTES.

Some North Devon Rubi.—Towards the end of last July I passed over some well-trodden ground between Ilfracombe and Clovelly, on the coast of N. Devon, where it is unlikely that much has remained unnoticed by previous observers. But as on this excursion I met with two plants that are not recorded for the vice-county in Top. Bot. ed. ii., I am induced to offer my notes on the Rubi of the locality, premising that attention was given only to those forms that occurred in quantity:—*Rubus Lindleianus* Lees. Hedges between Ilfracombe and Lee; Morthoe; Clovelly.—*R. rhamnifolius* W. & N. Woollacombe; Morthoe; Clovelly.—*R. rusticanus* Merc. Very abundant all along the coast in hedges and on furzy downs by the sea.—*R. micans* Godr.=*R. adscitus* Genev. Plentiful on the slopes adjacent to the "Hobbie" at Clovelly; also at Westward Ho! Name given by Dr. Focke. I may remark that the name *micans* does not occur in British authors, and that neither it nor *adscitus* is made use of in the Consp. Flor. Europ. Nyman has six columns of names in his Rubus Index, but those of Genevier and other French botanists are not mentioned. However, *R. adscitus* Genev. has become well known in Britain since it was identified at Plymouth by Mr. Briggs. Placed hitherto as a variety under *villicaulis*, from which it differs in possessing many aciculi and setæ, it will perhaps have to be recognised as a distinct species. In the 'Flore de France' *R. micans* stands as one of the twenty-four aggregates among which the authors group the brambles of their country.—*R. Lejeunei* Weihe. In great quantity on the hill and by the roadside in the "Hobbie," Clovelly. A very handsome bramble. Dr. Focke says this is the same as the Plymouth plant, and he believes it to differ only in habit from typical *Lejeunei*.—*R. corylifolius* Sm. Frequent about Hele, Saunton, and Bideford.—J. WALTER WHITE.

NEW RECORDS FOR SCOTLAND.—The following notes give the names of a few plants apparently unrecorded for the county of Caithness and vice-county of West Sutherland. They were noticed in the course of a short visit to the north during the last ten days of July, 1889. Those marked with an asterisk (*) appear to be entirely new to the county, and the localities of the other appear to be new. I have added a mark of interrogation to some of the *Hieracia*, as they are still to a certain extent *sub judice*. I am greatly indebted to Mr. F. J. Hanbury for kindly looking over the *Hieracia*, and to Mr. Arthur Bennett for verifying or naming most of the other plants:—

CAITHNESS.—*Papaver dubium*. Corn-fields, Reay.—*Viola amœna*. Dunnet Hill.—*Sagina apetala*. Edge of field, Reay.—*S. nodosa*. Reay Links; banks of Isauld Burn, Reay.—*Radiola Millegrana*. Telegraph Station, Dunnet Hill; a large patch of very minute plants.—*†*Acer Pseudo-platanus*. Fairly-grown trees in seed in several plantations near Thurso and Reay.—*Cytisus scoparius*. Near Thurso on the road to Reay.—*Agrimonia Eupatoria*. In the turf in MacDonald Square, Thurso.—**Rosa canina* var. *biserrata* (Mér.) Isauld Burn.—*Parnassia palustris*. In great plenty on banks of Thurso River.—*Ligusticum scoticum*. Cliffs, Dunnet Hill.—*Angelica sylvestris*. A stunted growth, frequent on cliffs between Thurso and Reay.—*Valerianella olitoria ?*. Field, Reay.—**Solidago Virgaurea* var. *cambrica* (Huds.) Cliffs, Dunnet Hill.—*Hieracium iricum*. Dunnet Hill; near Scrabster.—**H. caledonicum* F. J. Hanbury (?). Scrabster.—*H. auratum* Fr. Sandside and Isauld Burns.—**H. umbellatum* (?). Near Reay.—*Sonchus arvensis*. On rocky ledges, Dunnet Bay.—*Tragopogon pratensis*. Sand-hills, Reay. **Campanula rotundifolia* var. *lancifolia* Koch. Dunnet Hill.—*Lamium intermedium*. The common dead-nettle in fields near Dunnet.—*†*Mimulus guttatus*. In the greatest profusion in a burn near Reay, extending for half a mile on both sides, and in the shallow parts of the stream. **Veronica Anagallis* var. *anagalliformis*. Dunnet Burn.—*Plantago maritima* f. *vivipara*. A largish patch comprising many plants, hill-side near Reay.—*Salsola Kali*. Sandy shore, Reay.—*Salix repens*. Dunnet Hill.—*S. argentea ?*. Cliffs, Dunnett Hill.—*Listera ovata*. Banks of Isauld Burn.—*Habenaria conopsea*. Near Scrabster.—*H. viridis*. Banks of Isauld Burn.—*Schœnus nigricans* f. *nana* Lange. Links east of Reay.—*Carex* *pulicaris.* Banks of Thurso River. — **C. vulgaris* var. *juncella.* Thurso River.—**C. paludosa.* Isauld Burn.

West Sutherland. — **Thalictrum majus* Crantz. East bank of the Naver River, Bettyhill.—**Erodium cicutarium.* Near Bettyhill. —**Senecio sylvaticus.* Bettyhill.—*S. Jacobæa* var. *flosculosus* (Jord.). Plentiful on hill-sides, and by road-sides round Bettyhill. Mr. Hanbury noticed it last year. I also saw several plants intermediate between the variety and the type.—*Hieracium nitidum.* Cliffs near the mouth of the River Naver.—**H. sparsifolium* (?). Strath Naver. —*H. auratum* Fr. Melvich; near the mouth of the River Naver; near Altnaharrow.—*H. strictum* Fr. Strath Bagaisteach.—**Pyrola media.* Strath Bagaisteach. — *Stachys arvensis.* Probably introduced, growing on waste land formerly under cultivation; Creag Ruadh, Bettyhill.—*Juncus fluitans.* Altnaharrow.—*Carex filiformis.* Loch Mer, Invernaver. — **Arrhenatherum avenaceum.* — William F. Miller.

NOTICES OF BOOKS.

Handbook of the Bromeliaceæ. By J. G. Baker, F.R.S., F.L.S. 8vo. Pp. xi. and 243. London: G. Bell & Sons. August, 1889. Price 5s.

This handbook, uniform, as the author reminds us, with those already published on the Fern-allies and Amaryllideæ, represents another of Mr. Baker's generous gifts to Systematic Botany. Monographs of some of the larger genera have already appeared in this Journal, and the great attention which the order has recently received is seen from the fact that while the "Synopsis of *Æchmea*," published in this Journal for 1879, contains 58 species, no less than 128 are described in the "Handbook." *Pitcairnia*, in 1881, included 70 species, as against 130 in 1889; and so recently as 1888, *Tillandsia*, which now numbers 323, contained only 241 species. This increase is largely due to the energy of Dr. Glaziou, of Rio Janeiro.

The present hand-book contains descriptions of above 800 species, more than double Mr. Bentham's estimate of the number known in 1883, the date of publication of the third volume of the 'Genera Plantarum.' This, Mr. Baker says, is doubtless "far short of the number that will ultimately be found," for "during the last year M. André has added 60 new species from his own gatherings in New Granada and Ecuador, and Dr. Wittmack about 20 from the collections of Consul Lehmann." In fact, it seems only necessary to seek in order to find, for from quite a few Bromeliads collected near Pernambuco in 1887 by Mr. Ramage, Mr. Baker describes a new one, *Æchmea Ridleyi.*

In drawing up about two hundred of the descriptions, the author has had the advantage of the living plants at Kew; the dried collections at the British Museum and Kew have together supplied specimens of about half the known species, and the herbaria of Berlin and Paris have also contributed. To judge from the text, Professor Morren's water-colour drawings have been an important aid; "described from Prof. Morren's drawing" occurs repeatedly at the end of descriptions, not only of Morren's own species, but also of new ones which Mr. Baker has been able to found on the sketches. In the genus *Cryptanthus*, containing twelve species, five are thus described, one *C. Makoyanus* for the first time. "M.D." in brackets after the name signifies, as we are told at the bottom of page 2, that there is an original drawing of the plant in the Morren Collection at Kew. The end of the Preface would have been a better place for such a note. *Apropos* of figures, Mr. Baker quotes these at the commencement of each description, and it is a great help to have his opinion as to what some of them are meant to represent. He has run down nearly all the plates of Vellozo's 'Flora Fluminensis"! Except for occasional misprints, these references are mostly correct. Horticulturists will welcome the addition of the date of introduction and first-flowering of cultivated species.

The Order is divided into the same three great Tribes as in the 'Genera Plantarum,' *viz.*:—

I. *Bromelieæ*, characterised by an inferior ovary and berried fruit, and leaves nearly always spine-margined.

II. *Pitcairnieæ*, with capsular fruit and seeds of which the funiculus does not break up into fine threads, and

III. *Tillandsieæ*, where the capsular fruit is always entirely superior, the funiculus breaks up into threads, and the leaves are always without marginal prickles.

We mention this, because Wittmack, who has written the *Bromeliaceæ* for Engler and Prantl's 'Pflanzenfamilien,' separates *Puya*, *Encholirion*, *Dyckia*, and *Hechtia* as a distinct tribe, *Puyeæ*, distinguished from *Pitcairnieæ* (*Brocchinia* and *Pitcairnia*) by its entirely superior ovary, and from *Tillandsieæ* by its toothed leaves. The new tribe does not approach in distinctness to the three older ones, which are so well marked and natural. *Pitcairnieæ*, as Tribe II, of the present arrangement, gives us a perfect gradation between the epigynous *Bromeliæ* and the perfectly hypogynous *Tillandsieæ*. The Key to the Genera, on page x. of the 'Handbook,' shows this at a glance. First *Brocchinia* and André's new genus *Bakeria*, with the capsule free only near the tip; then *Pitcairnia*, with the capsule free except near the base; and finally *Puya*, *Cottendorfia*, *Dyckia*, and *Hechtia*, all with a capsule entirely superior. Some of the Pitcairnias, forming the section *Puyopsis* exactly resemble *Puya* in leaf and habit, being only distinguishable by the loculicidal dehiscence of its capsule, a character which separates it quite as much from *Dyckia* and *Hechtia*.

The subdivision of the first tribe, *Bromeliæ*, is much the same as that followed in the 'Genera,' where we find three divisions depending on the freedom or complete or partial coherence of the sepals and petals. Mr. Baker makes two divisions; in the first, comprising *Karatas*, *Greigia*, and *Distiacanthus*, the petals are united into a distinct tube, which is usually as long as the calyx-limb. In the 'Genera' the first group includes *Streptocalyx* and *Bromelia*, where the petals cohere just at the base. Mr. Baker's second group is characterised by petals free or joined only at the very base, and is again subdivided into two, the first group with sepals united into a distinct tube, the second with sepals nearly or quite free. The former corresponds to the second division of the 'Genera Plantarum,' the latter to the third, with the exception that *Rhodostachys*, the last genus in the second division, appears in Mr. Baker's last division, where we also find *Streptocalyx* and *Bromelia*. Thus the difference between the two arrangements depends entirely on the value given to a very slight coherence of the petals or sepals, and whether plants where such obtains are mostly related to those with quite free or distinctly coherent floral leaves.

The new arrangement gives the first group an additional character in the well-marked capitular inflorescence, whereas *Bromelia* has a dense panicle and *Streptocalyx* a raceme. Moreover, *Streptocalyx* is thus placed nearer the closely allied *Portea*, from which, "it differs mainly by its ovate sepals united into a distinct cup above the ovary."

Two new genera are established, *Distiacanthus* and *Fernseea*. *Distiacanthus* comprises two cultivated plants introduced by Linden, allied to *Karatas* and *Greigia*. *Fernseea* is a new genus of one species, "differing from *Bromelia* by its inflorescence, bract-like stem-leaves, calyx cupular above the ovary, and long, much-contorted stigmas, named after the late Baron Wawra von Fernsee, who has collected and carefully described and figured this and many other of the most interesting Brazilian *Bromeliaceæ*." The examination of actual specimens has led to the confirmation of Regel's genus *Ortgiesia*, which Bentham had not seen, and Klotzsch's genus *Acanthostachys*, both sunk in the 'Genera.'

Wittmack's tribe *Bromelieæ* is identical with Mr. Baker's and that of the 'Genera,' but the 'Handbook' has 19 genera, while Wittmack makes 26. The higher number is obtained by separating as genera, groups which Mr. Baker considers only of subgeneric value, viz., *Nidularium* (Lemaire) from *Karatas*, and *Pothuava*, *Lamprococcus*, and several others from *Æchmea*.

The second tribe, *Pitcairnieæ*, contains the new monotypic genus *Bakeria*, "intermediate between *Brocchinia* and *Cottendorfia*." It was founded by M. André, in the 'Revue Horticule,' 1889 (p. 84), on a plant flowered at Le Fresne, in May, 1888, probably from Brazil. All workers at Bromeliads will appreciate the dedication. The genus *Cottendorfia* Schultes fil., is restored and enlarged by two new species of Baker and one of Brongniart, making six in all. On the other hand, *Encholirion* Mart., which in the 'Genera Plantarum' embraces *Prionophyllium* Koch, is now merged in *Dyckia*, *Prionophyllium* and *Encholirion* forming two subgenera. As stated above, Wittmack splits up the tribe into *Pitcairnieæ*, including *Brocchinia* and *Pitcairnia*, and *Puyeæ*, containing *Puya*, *Encholirion*, and *Hechtia*.

In Tribe III., *Tillandsieæ*, *Schlumbergeria* becomes a subgenus of *Caraguata;* in the 'Genera Plantarum' it is queried, with the remark, "Omnia *Caraguatæ* nisi inflorescentia laxior ramosa." It appeared as a distinct genus in Mr. Baker's revision of 1888. Otherwise, the division with its five genera is arranged as in the 'Genera Plantarum.' Wittmack's *Tillandsieæ* has eight genera, for he recognises as distinct *Massangea*, also a subgenus of *Caraguata* in the 'Hand-book,' and *Schlumbergeria*, considering the variations in length and coherence of the perianth and staminal whorls to be of generic value. He also separates *Vriesea* from *Tillandsia*.

Having gone steadily through the book, while arranging by it the *Bromeliaceæ* in the Herbarium of the British Museum, we may perhaps be allowed to point out a few matters which suggest criticism.

The key to the Genera with which the book opens, and those to the species with which all the larger genera are supplied, are of great assistance in naming specimens, but now and again there comes a little hitch in the arrangement. For instance, in the key on p. x., the variations in relative length of sepals and petals are used as distinguishing characters between the four genera, *Streptocalyx*, *Æchmea*, *Billbergia* and *Quesnelia*, and those of *Æchmea* are said to be "usually not much longer than the sepals." But on p. 32, in the diagnosis of the genus, we read, "petals two or three times the length of the sepals"! A glance through the descriptions of the species shows that the relation between the lengths is very variable, the petals may be only "shortly protruded" in one species, and "twice as long as the sepals" in the next. Again, in the key to the Subgenera of the group *Tillandsieæ*, *Diaphoranthema* heads the list of those with *rosulate* leaves, but the leaves, though often tightly packed on the stem, apparently never form a rosette.

There seems to be a curious fatality about Mandon's numbers which are quoted, the plants often varying considerably in detail from the printed description. Thus Mandon 1174 is *Tillandsia biflora* Ruiz & Pav., and ought therefore to have the panicle 3–4 in. long, the lower branch-bracts 1½ in., and the flower-bracts ⅓ in. long; but in Mandon's specimen at the British Museum these are respectively 8 in., 5–6 in., and ⅔ in. Similarly, 1177, *T. capillaris*, has leaves nearly 2½ in. instead of 1 in. In *T. virescens*, on the contrary, the leaves and peduncle only reach half the lower measurement given. Small discrepancies of this nature are not infrequent, and of course must be expected to a certain extent, as plants will vary, but this marked association with one particular set is curious. *Pitcairnia asterotricha* Pöpp. & Endl., and *Puya grandiflora* Hook., are regarded as synonyms of *Pitcairnia ferruginea* Ruiz & Pavon, but the petals of the species are described merely as yellowish white; this is true for *P. grandiflora* only, Pöpp, & Endl. have "dilute livide purpureis," and Ruiz & Pavon "sub-purpureis."

In conclusion, we must thank Mr. Baker for so frequently quoting numbers, the full value of which is best appreciated when they are wanted; but to quote all would add considerably to the size of the book, and this might not be desirable.

A. B. Rendle.

Names and Synonyms of British Plants. Collating the Nomenclature of the 'London Catalogue,' 'English Botany,' Babington's 'Manual,' Bentham's 'Flora,' and Hooker's Student's Flora.' With an Appendix giving other Names and their Synonyms, and a List of Authorities for Plant-names. By GEOFFREY EGERTON-WARBURTON, B.A. London; Bell & Sons. 1889. 8vo, pp. xxxvi. 160. Price 2s. 6d.

Index of British Plants according to the 'London Catalogue' (eighth edition), including the Synonyms used by the principal authors; an alphabetical list of English Names; also references to the illustrations of Syme's 'English Botany,' and Bentham's 'British Flora.' By ROBERT TURNBULL. London: Bell & Sons. 1889. 8vo, pp. [ii.] 98. Price 2*s.* 6*d.*

THESE somewhat lengthy titles fully explain the object of these little works, which are laudably intended (to quote the latter of them) "to make the difficulties of botanical nomenclature somewhat less, whilst it may at the same time point out what perplexing confusion does exist, not only in the names given to various plants, but also in the rank they should take as species, subspecies, or varieties,—a confusion which extends sometimes to the authorities given for the names,—an extreme instance of this being the name '*Potentilla Tormentilla,*' which has a different authority assigned to it by each of the works quoted in this list."

This introductory statement, coupled with one which tells us that "the place of honour [is] given to that name for a plant which is used by a majority of the five works named on the title-page," shows at once that Mr. Egerton-Warburton is not thoroughly qualified for the work which he has undertaken. So long as the world lasts, there will be differences of opinion as to the limits of species; while, on the other hand, the right authority for a name and the proper one to be adopted are quite capable of being determined,—not indeed by a *plébiscite* of authors, but by a strict observance of the rule of priority. This the author might have achieved, though not without the expenditure of much time and trouble: but he makes no attempt to do this. He calls attention to the varying authorities given for *Potentilla Tormentilla;* but instead of settling once for all which should be adopted, he prints "*Potentilla Tormentilla* Schenk or Neck. or Nestl. or Sibth. or Scop."; and leaves us free to take our choice. Had Mr. Egerton-Warburton gone into the matter, he would have been able to correct the name itself, which must stand as *Potentilla silvestris* Neck.* (Deliciæ, i. 222 (1768)). The synonymy of the plant is indeed somewhat curious, for if *P. Tormentilla* be accepted as the name, not one of the authorities to which it is attributed above is responsible for it. Scopoli, indeed (Fl. Carn. ed. 2, i. 360), called it *P. Tormentilla erecta;* but the abbreviated form in common use was first employed by Stokes in his edition of Withering. The names stand thus:—

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* Not "Nestl." as given by Nyman (Consp. i. 227).

Potentilla silvestris Necker (Deliciæ i. 222), 1768.
P. Tormentilla erecta Scop. (Fl. Carn. ed. 2, 535), 1787.
P. Tormentilla Stokes (With. Arr. ed. 2, ii. 535). 1787.

So much care has evidently been bestowed on this little book, that it is with regret that we point out its insufficiency. No small amount of labour, for instance, must have been employed in the list of "authorities for plant-names used in any of the five works quoted, each name being followed by the place or country and date of birth, and the date of decease, when these are known." The type is excellent, and misprints, although not absent, are rare; the introduction of a period between the name and its authority,—"Centaurea aspera. L.,"—is an objectionable innovation.

It is remarkable that, so shortly after the production of Mr. Warburton's book, another volume of the same kind should be issued by the same publishers. There must certainly be a belief in the minds of some that compilations of this sort are useful, whereas nothing can be further from the fact. Mr. Turnbull adds certain items of useless knowledge, such as the position of each genus in the Linnean classification, and what he calls "English names," of which "Small-flowered Pale Smooth-leaved Willowherb" and "Michelian Cat's-tail-grass" may be taken as specimens. This author also "ventures to hope that [his attempt] may in some degree lessen the perplexities of nomenclature to the botanist," being evidently entirely unaware wherein these "perplexities" consist.

As concordances of the nomenclature employed in the books cited, these volumes may be of service to those, if there be any, who need such works. But their number can hardly be large enough to compensate the authors for the labour and expense which must have attended their production: and it is impossible not to regret that these should not have been devoted to some useful purpose.

The Forest Flora of New Zealand. By T. Kirk, F.L.S., late Chief Conservator of State Forests to the Government of New Zealand. Wellington: Didsbury. 1889. Folio, pp. xv., 345. tt. 142.

This Government publication constitutes a valuable addition to our knowledge of the New Zealand Flora. Mr. Thomas Kirk, in his official capacity as Conservator of New Zealand Forests—a post which we regret to see he no longer holds—has had exceptional opportunities for producing such a work, to which he brought capabilities of a high order. His long residence in New Zealand has enabled him to study the life-history of the trees and other plants which he describes; and the value of the present volume is largely due to the numerous plates showing, in many instances, various stages of growth, which have been executed by various artists under Mr. Kirk's superintendence.

The plan of the work is thus stated in the preface:—"The first portion of the text contains historical information and other particulars of general interest connected with the plant, an account of its dimensions, habit of growth, &c., and a more or less detailed statement of the structure of the flower and fruit, devoid of technicalities. This is followed by a concise account of its properties and uses, and, in the case of the more important kinds, the mode of working the forest, conversion, commercial value, &c. A brief statement is given of the distribution of the genus, and a more detailed account of the distribution of the species. The article is completed by a botanical description of the species and an explanation of the plate. In most cases enlarged representations of the parts of the flower and fruit are given to facilitate identification."

It seems a little unfortunate that some systematic disposition of the species should not have been attempted, but a synopsis of the characters of the orders and genera is given in the appendix, thus modifying the inconvenience of the want of arrangement.

The genera principally dealt with are *Coprosma*, *Dacrydium*, *Fagus*, *Metrosideros*, *Myrtus*, *Olea*, *Olearia*, *Phyllocladus*, and *Podocarpus;* the order *Coniferæ* has received special attention, drawings of a few small species having been included "on account of their interesting character, although they possess but little economic value." Mr. Kirk, indeed, appears throughout to have been mindful of the double purpose of his work, and the botanical and technological portion are treated with equal care.

Manual of Orchidaceous Plants. Part. V. MASDEVALLIA. Chelsea: James Veitch & Sons. 8vo, pp. 82. Price 7*s.* 6*d.*

THIS fifth part of the 'Manual of Orchidaceous Plants' treats on *Masdevallia* and the allied genera, *Pleurothallis, Cryptophoranthus, Restrepia, Arpophyllum*, and *Platyclinis.* The five latter genera are of little horticultural importance, and have therefore been only shortly described. The genus *Cryptophoranthus* was founded in 1881 by Rodriguez. None of his species, however, are included under this name in this part, but two well-known plants have been removed to it, viz., *Pleurothallis atropurpurea* (syn. *Masdevallia fenestrata*) and *Masdevallia Dayana*, which are popularly known as "Window-Orchids," on account of the openings on each side caused by the sepals being united at their tips. The plants known in gardens as *Dendrochili* have also been placed in their proper position under the Benthamian genus *Platyclinis*, true species of *Dendrochilum* not being at present in cultivation.

The chief value of this part is to be found in the synopsis of the genus *Masdevallia.* Sixty good species are here described; more than twice that number are known to science, but many of them are of botanical interest only. An attempt has been made at classification, the species being divided to form sections, three of which are Reichenbachian, viz.:—(1) *Eumasdevallia*, (2) *Saccolabiatæ*, and (3) *Triaristellæ.* The fourth section has no name, but is typified by *M. swertiæfolia* and *M. gibberosa.* These sixty-six species include several plants hitherto regarded as species, but which are now classed either as synonyms or varieties. The Chimæroid section has been well treated, but we cannot altogether accept *M. acrochordonia* as a synonym of *M. Ephippium.* It is in the same section certainly, but it requires a somewhat elastic imagination to make it agree with *M. Ephippium* at all, except in colour. The flowers, when viewed laterally, are oblong-obovate, and not suborbicular; the tails are also much shorter, and spirally twisted, especially those of the lateral sepals, and the leaves are, in comparison, much broader and more obtuse than in *M. Ephippium.*

As in the preceding parts, hybrids—natural and artificial—are described at the end of the species, but they are not yet very numerous in this genus.

The coloured maps, which formed such a conspicuous feature in other parts of this work, are absent from this, Messrs. Veitch deeming them unnecessary, as the habitats of the Masdevallias could be seen by reference to the maps which accompanied the descriptions of Odontoglossums and Cattleyas. We regret the absence of the maps, as it is awkward to have to refer back to another part for this information.

We were particularly struck with the cut of *M. racemosa*, reduced to half natural size, showing a spike of fourteen flowers open *at once*. We have seldom seen more than one, or very rarely two or three, flowers open at once on cultivated plants. The lowest flower opens first, and as soon as it is over the one above it, and so on to the top of the raceme. But the illustration may have been made from a wild herbarium specimen. JOHN WEATHERS.

ARTICLES IN JOURNALS.

Bot. Centralblatt (Nos. 49–52). — S. Rostowzen, 'Ein interessanter Wohnort wilder Pflanzenformen.'

Botaniska Notiser (Häft. 6).—B. Jönson, 'Positivt heliotropiska luftrotsfasciationer hos *Aloe brevifolia*.' — L. M. Neuman, 'Studier öfver Skånes och Hallands flora.'—B. Cöster, '*Ajuga pyramidalis* × *reptans*.' — J. R. Jungner, 'Om Papaveraceerna i Upsala Botaniska Trädgånd jemte nya hybrida former.'

Bot. Zeitung (Nos. 47–49).—H. Solms-Lambach, 'Die Heimath und der Ursprung des *Carica Papaya*.' — (Nos. 50–52). F. Hegelmaier, 'Ueber dur Keimsack einiger Compositen und dessen Umhüllung.'

Bulletin Bot. Soc. France (xxxvi. 6: Dec. 1). — A. Pomel, *Cyclamen saldense*, n. sp.—P. Fliche, 'Notes sur la flore de la Corse.' —Memoir of Paul Antoine Sagot (1821–1888).—L. Guignard, 'Sur les anthérozoides des Marsiliacées et des Equisétacées.' — D. Clos, '*Convolvulus tenuissimus*.' — L. Mangin, 'Observations sur le développement du Pollen.'— —. Hy, 'Sur les modes de ramification et de cortication dans la famille de Characées.'

Bull. Torrey Bot. Club (Dec.).— J. Schrenk, 'Floating-tissue of *Nessæa verticillata*' (3 plates).— N. L. Britton, 'Plants collected by Rusby in S. America' (*Galactia montana, Bauhinia Rusbyi, Calliandra Boliviana*, spp. nn.).—L. H. Bailey, 'Classification of Slight Varieties.'

Gardeners' Chronicle (Dec. 7). — *Stapelia erectiflora* N. E. Br., n. sp.—(Dec. 14). *Stapelia Desmetiana* N. E. Br., n. sp.—(Dec. 21). *Massonia amygdalina* Baker, n. sp. — (Dec. 28). N. E. Brown, '*Paulowilhemia speciosa*' (fig. 106).

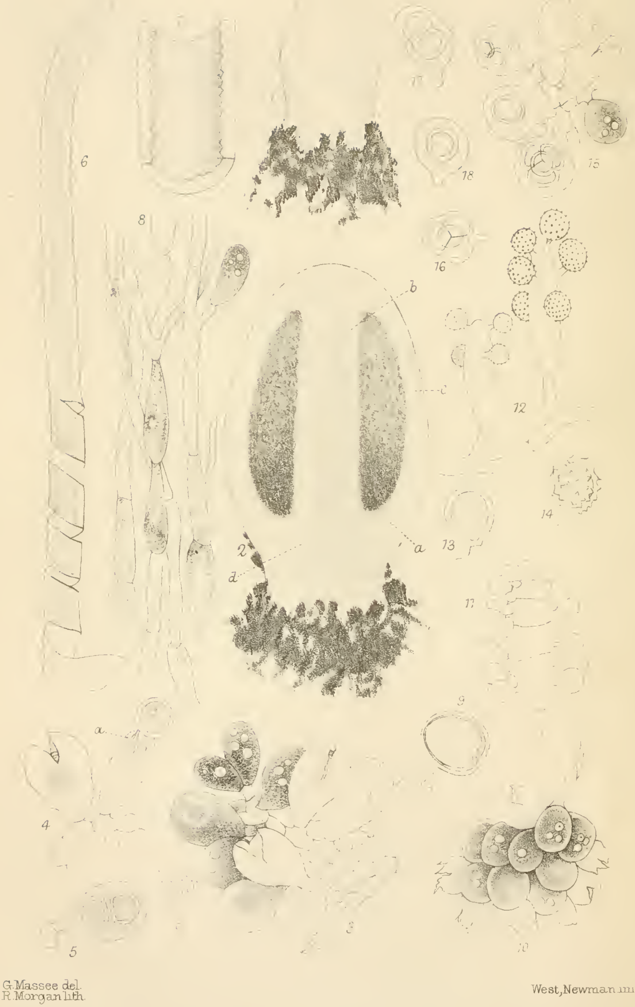
Oesterr. Bot. Zeitschrift (Dec.). — L. Charrel, '*Colchicum micranthum* Boiss.' — R. Wettstein, 'Studien über die Gattungen *Cephalanthera*, *Epipactis*, & *Limodorum*' (1 plate).—J. A. Knapp, 'Die Heimath der *Syringa persica*.' — H. Zukal, 'Ueber die Entstehung einiger Nostoc- und Glœococapsa-formen.'—H. Sabransky, *Rubus Spitzneri*, n. sp. -- J. Freyn, 'Plantæ Karoanæ' (*Astragalus Karoi*, n. sp.).--H. Braun, '*Rosa sarmentosa* Woods.'

Trans. Bot. Soc. Edinburgh (xviii. 3: Dec. 1889).— A. Galletly, 'Wood of Resin-producing trees.' — D. Christison, 'Increase in Girth of Trees.' — G. Bird, 'Rarer Plants of Dovrefjeld.' — A. Bennett, 'Records of Scottish Plants during 1888.' — J. E. T. Aitchison, 'Botanical Features of Country traversed by Afghan Delimitation Commission, 1884–5.' — Id., 'The Source of Badsha, or Royal Salep.'—F. B. White, 'Willows in Edinburgh University Herbarium.' — P. Sewell, 'Flora of the coasts of Lapland and Siberia' (*Carex Sewellii* A. Benn. & C. B. Clarke, n. sp.: 1 plate). —J. W. H. Trail, 'Galls of Norway.' — Id., 'Fungi of Hardanger' (*Leptosphæria quadriseptata*, *Ophiobolus immersus*, *Ramularia Oxyriæ*, *Phyllosticta Geranii*, *Septoria Rumicis*, *Rhabdospora Artemisiæ*, *Marsonia Salicis*, spp. nn.). — J. Wilson, 'Fertilisation of *Apidistra* by Slugs.'

LINNEAN SOCIETY OF LONDON.

Dec. 5, 1889.—Mr. J. G. Baker, Vice-President, in the chair. —The following were elected Fellows of the Society:—Rev. J. H Crawford, Major A. R. Dorward, Messrs. S. A. Moor, W. Rome, J. Shirley, H. L. Stonham, C. W. Turner, J. T. Tristram Valentine, J. H. Veitch, J. J. Walker, and John Watson.—Mr. George Murray exhibited and made some remarks upon specimens of *Struvea macrophylla* and *S. plumosa*.—Mr. A. W. Bennett communicated some observations on a new and a little-known British Fresh-water Algæ, *Schizothrix anglica* and *Sphæroplæa annulina*. It was pointed out that *Schizothrix* of the 'Phycologia Britannica' is really an *Inaetis*. —Mr. E. M. Holmes exhibited, as a new British Marine Algæ, a specimen of *Gracilaria divergens*, a rare native of the warmer portions of the Atlantic and the Mediterranean, which had been recently found at Brighton by Mr. J. Myles. The specimen exhibited possessed tetrosporic and cystocarpic fruits not described by Agardh.—Mr. T. Christy exhibited and made remarks on some "liquid amber" or resin, *Altingia excelsa*, from Cochin China. -- A paper was then read by Mr. George Massee on the life-history of a stipitate Fresh-water Algæ, illustrated by some excellent diagrams. A discussion followed, in which the chairman, Mr. Murray, and Mr. Bennett took part.

We regret to record the death of Prof. W. R. McNab, of Dublin, which took place on Dec. 3rd. We hope to give a notice of the deceased botanist next month.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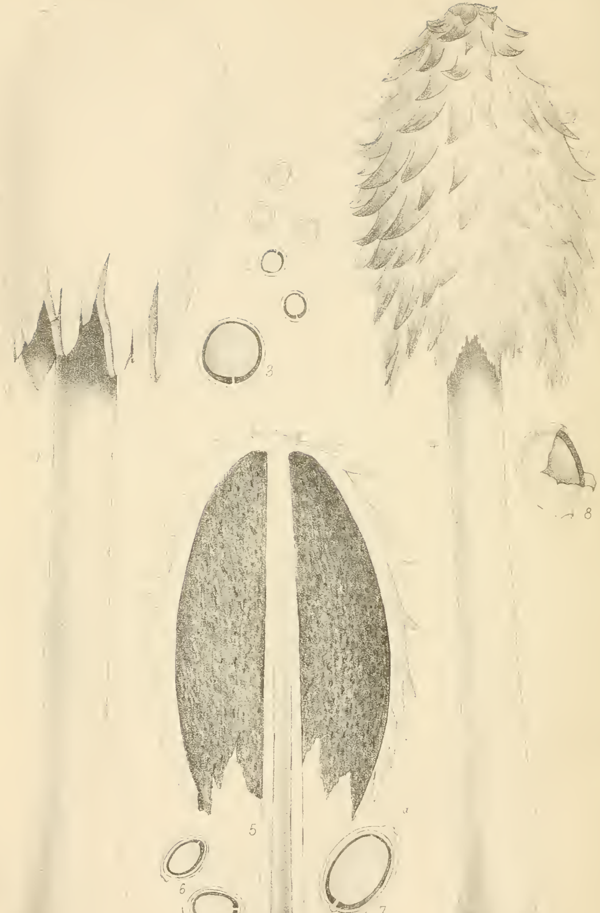
G. Massee del.
R. Morgan lith.

West, Newman imp.

Podaxis Indica *Spreng.*

Tab 295



G Massee del.
R Morgan lith

West, Newman imp

Podaxis Farlowi, *Mass.* n sp.

A MONOGRAPH OF THE GENUS *PODAXIS* DESV. (= *PODAXON* FR.).

By GEORGE MASSEE.

(PLATES 294 & 295.)

THE genus *Podaxis* has up to the present been considered as typical of the *Gastromycetes*, which, with the *Hymenomycetes*, constitute one of the primary divisions of Fungi known as the *Basidiomycetes*, characterised by having the spores produced from the apices of large clavate cells or *basidia*. The receipt of a batch of *Podaxis indica* Spreng. (= *Podaxon pistillaris* Fr.), from South Africa, including some very young specimens, has led to the unexpected discovery that the spores are produced in asci, consequently the genus belongs to the *Ascomycetes*. The species of *Podaxis* are amongst the largest of fungi, and so close is the general appearance to that presented by typical *Gastromycetes*, that they have hitherto been mistaken for long-stalked puff-balls, with stems varying from ten to fourteen inches high, and half-an-inch or more in thickness; the head is usually ovate, from three to seven inches high, and at maturity filled with a dense powdery mass of spores, usually mixed with threads. In Saccardo's 'Sylloge Fungorum' the genus *Podaxon* is given as the type of a tribe of Gastromycetous fungi called *Podaxineæ*. It may be stated that all the genera included in the above-named tribe, with the exception of *Podaxis*, belong to the *Gastromycetes*.

MORPHOLOGY.

Differentiation of the gleba up to the escape of the spores from the asci takes place while the fungus remains under ground. The youngest specimen examined was broadly elliptical, 2 cm. high by 1·5 cm. in diameter, and furnished at the base with a white, cobweb-like mycelium that had bound together the sand into a compact bulb-like mass. At this stage the plant consists of a homogeneous weft; the component hyphæ are richly supplied with densely granular, vacuolated protoplasm; the walls are very thin, and transverse septa numerous. The average diameter of the hyphæ is about 6 μ, but in numerous instances certain cells become inflated into a more or less spherical or pyriform shape, and many of the blind ends of lateral branches terminate in a broadly obovate cell (fig. 8). The walls of the hyphæ become violet at once on the application of sulphuric acid and iodine. The hyphæ run mostly in the direction of the axis of growth, giving off numerous lateral branches, which thread irregularly between the ascending primary hyphæ, and usually terminate in blind ends. The weft is compact, but the hyphæ are not crowded, and there are many small, irregular interstices containing air. When the fungus has reached a height of 5 cm. with a diameter of 3 cm., a vertical median section shows a considerable amount of internal differentiation, and strongly recalls to mind the appearance of a section of a young agaric belonging to the section *Amanita*. For a distance of 1 cm. from the base the tissue is very compact, and is continued upwards as a stout, central, cylindrical axis; a thick peripheral portion of the young fungus, in organic continuity with the apex of the central axis and the basal compact portion, also remains as a protective wall, homologous with the pileus of an agaric; finally, the weft of hypha between the central axis and the external wall becomes the gleba, which in the median vertical section appears as an elongated elliptical area on each side of the central axis, occupying the same position as the gills in the vertical section of a young, unexpanded agaric (fig. 2).

Contemporaneous with the above changes, the hyphæ forming the peripheral portion of the entire fungus for a thickness of about 1 mm., owing to gelification of their walls, have formed an external cartilaginous coat, adnate at first to the inner, still living portion, as in the genus *Bovista*. There is an absence of the sinuous cavities bounded by well-defined tramal-plates, so characteristic of *Gastromycetes*, but from the earliest condition the gleba presents a sponge-like structure, its very irregular walls consisting of thin-walled, sparsely septate hyphæ, originating as lateral branches from the hyphæ forming the central axis or the inner portion of the outer protective wall. Mixed with the colourless, thin-walled hyphæ described above are others, which originate from the hyphæ of the axis; these latter eventually become coloured, and form the capillitium. The thin-walled colourless hyphæ forming the irregular walls of the gleba send into the interstices numerous long, lateral branches ; these branches—the ascogenous hyphæ—are aseptate, have very thin colourless walls, are richly supplied with granular vacuolated protoplasm, average about 6 μ in diameter, and at the tips produce two or more short branches, which in turn emit short secondary branches, the whole forming a compact tuft; these terminal branches differ from the parent hyphæ in being broken up into numerous short cells by transverse septa; each component cell produces a lateral outgrowth, at first papillæform, then cylindrical, and eventually broadly obovate, and attached to the parent cell by a narrow neck; these terminal cells,—the asci,—after receiving all the protoplasm from the parent cell, are cut off from the latter by the formation of a septum across the narrow basal portion, and, when fully developed, measure about 20–24 × 12–14 μ. Owing to the fasciculate arrangement of the terminal branches, the asci are densely crowded, varying in number from ten to fifty, or even seventy on specially vigorous heads. The asci are developed in succession, and it is not unusual to meet with empty shrivelled asci, others with the spores not yet differentiated, and others quite young in the same cluster. I am inclined to believe that the short, ascigerous branches are also produced laterally on the aseptate hyphæ, but am not certain on this point. The asci are usually constant in form and size, but now and again an exceptionally large one may be seen, and sometimes one or more lateral prominences disturbs the usual symmetry of outline. The asci are normally monosporous, but occasionally two spores are produced, especially in the extra large or deformed examples (fig. 5).

When the spores are differentiated, but before attaining their full size, and while yet quite colourless, they escape from the asci through an irregular slit, the latter persisting in the shrivelled form seen on examining the hymenium of mature specimens (fig. 4). The spores, when mature, are broadly elliptical, or sometimes subglobose, averaging 10–12 × 9 μ, perfectly smooth, and of a deep translucent brown by transmitted light, and furnished with a single well-defined germ-pore. When the spores are first liberated, the colour of the gleba is very pale yellow, from this condition the coloration passes through primrose-yellow to clear brown, and eventually dark brown, as seen in the mass. The hyphæ forming the capillitium are readily recognised in the earliest condition of the gleba by their thick walls, absence of septa, and greater diameter than the ascogenous hyphæ, measuring 9–11 μ in diameter, and originate as lateral branches along with the ascogenous hyphæ, from the central column or stem. When young, the hyphæ of the capillitium are colourless, straight, rarely branched, and in this condition there is little or no indication of the spiral marking so conspicuous at maturity; during the development of the gleba the capillitium-threads pass through the same sequence of coloration as already described for the spores, commencing with pale yellow and ending with bright brown. If a mature brown hypha is examined, the optical section presents the appearance shown in fig. 6, proving the presence of a thick wall, smooth externally, and apparently enclosing an inner wall furnished with a very fine, close spiral. This appearance is in reality due to the inner surface of the single wall of the hypha being furnished with thin, close ridges arranged in a spiral manner (fig. 7). This internal corrugation of the wall is not due to apposition of new material, but to contraction of the inner portion of the thick wall, and it is due to this internal contraction that the originally straight hyphæ present the curled and contorted appearance seen at maturity; if mature much-curled hyphæ are treated with sulphuric acid or potassic hydrate, the internal ridges disappear, and the hypha becomes straight. At maturity many of these hyphæ break up into a flat spirally-twisted ribbon, which is also due to the expansion and disappearance of the internal ridges (fig. 6). In all probability the elasticity of the capillitium assists in dehiscence and spore-dissemination. After the formation of the spores, the compact basal portion below the point of attachment of the lower margin of the peridium to the central axis elongates into a hollow stem eight to ten inches high, elevating the yet closed peridium far above ground. The ripening of the gleba, as shown by the progressive coloration of the spores, commences at the base, and nearest the axis, and progresses towards the apex. When the spores are mature, and the capillitium fully developed, the ascogenous hyphæ with the clusters of shrivelled asci can still be seen, and although usually colourless, are in some instances more or less tinged with brown; in the clusters of split shrivelled asci are others that present no split or fracture in the wall; these are homologous with the so-called sterile basidia or paraphyses; at this stage the peridium breaks away from the stem at its lower point of attachment, the margin being irregularly torn, when it resembles a half-expanded agaric; eventually the whole of the dry and brittle peridium breaks away, and the stem remains, with its blackish-brown mass of spores and capillitium resembling a bulrush, the final dispersion of the spores being effected by wind and rain.

Of the six remaining species, I have only had an opportunity of examining dry herbarium specimens, and Dr. E. Fischer, from an examination of similar material collected by Dr. Schinz in South-west Africa,* states that in *Podaxon carcinomalis* the spores are borne at the apices of basidia, as described by Prof. De Bary.† Now De Bary's remarks on this point are as follows:—"Specimens of *Podaxon pistillaris*, or an allied species, which were younger, but had reached their full size,‡ showed the cavity of the peridium filled with a gleba containing an extremely large number of narrow and very sinuous chambers, very thin tramal-plates, and a dense hymenial layer consisting entirely of stout four-spored basidia. The capillitium-threads were already discernible as broad but thin-walled hyphæ passing on one side into the wall of the peridium, on the other into the columella, and in the gleba running as in *Lycoperdon*, partly in the tramal-plates, partly transversely through the chambers."§ The above detailed account proves conclusively that the specimen examined by De Bary was not a species of *Podaxon*. As already stated, the gleba in the last-named genus is from the earliest condition entirely destitute of chambers bounded by well-defined tramal-plates, as shown in immature herbarium-specimens, which are by no means uncommon; in the Kew Herbarium alone there are over fifty specimens of the various species, many very young, and in every species there is the same spongy gleba, composed for the most part, or in some species entirely, of ascogenous hyphæ, which are arranged in small, irregular, concentrated portions, connected by straggling hyphæ; between these latter the elongated branches bearing the clusters of asci grow, originating from the hyphæ of the denser portions; there is no hymenium in the sense of a tramal-plate, and having its surface covered by a dense hymenial layer consisting entirely of stout four-spored basidia, as in the specimen examined by De Bary, which nevertheless describes exactly the structure presented by authentic specimens of *Cauloglossum transversarium* Fries, a fungus bearing in vertical section a close superficial resemblance to an immature *Podaxis*, but which on microscopic examination proves to belong to the *Hymenogastreæ*, and characterized by the clavate form, more or less attenuated downwards into a stem, which continues through the gleba as a central axis, the gleba consisting of numerous very small sinuous cavities, bounded by thin tramal-plates having their free surfaces completely covered with large, obovate, four-spored basidia. In *Cauloglossum* proper the base of the peridium does not break away from the central axis at maturity, the dispersion of the spores taking place only after the decay of the entire fungus, as in most, if not all, of the members of the *Hymenogastreæ*.

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* Hedw. 1889, Heft. i. pp. 1—8, pl. i.

† Vergl. Morphol. u. Biol. der Pilze (1884), p. 343.

‡ In the Herbarium at Berlin, marked Schweinfurth, Iter. 2, No. 275.

§ 'Fungi, Mycetozoa, and Bacteria,' p. 318. Engl. Ed.

The genus *Secotium* agrees in detail with *Cauloglossum* in the structure of the gleba, but in *Secotium* the gleba, instead of being elongated and clavate, as in *Caulogiossum*, forms a flattened expansion bent down all round the stem. Intermediate structures, with a similar gleba and central axis, connect the two last so-called genera. Berkeley's genus *Polyplocium* proves on examination of the type-specimen to be closely allied to *Montagnites*. Numerous specimens in the Kew and British Museum Herbaria, at present named and arranged according to the Friesian method, prove that the whole group at present known as the *Gastromycetes* requires a thorough revision; this can only be done by a careful examination of individual specimens, and not by a rearrangement, taking the already accepted names and descriptions as a basis, as has been done in Saccardo's 'Sylloge.' *Cauloglossum Ægypticum* of the last-named work is a true *Podaxis*.

Returning to Fischer's statement, the case is quite different the species figured is undoubtedly that known as *Podaxon carcinomalis* Fries, and the clavate structures that I have described as asci in *Podaxis indica* are considered as basidia, and drawn with four spores springing from the apex. It is difficult to realize that two funguses resembling each other so closely in every other respect, that from external characters alone would undoubtedly be considered as being the same species, should belong to the *Basidiomycetes* and *Ascomycetes* respectively, as would be the case assuming both observations on the origin of the spores to be correct, and yet every worker with specimens must know how treacherous general resemblances prove in many cases, and even in the seven known species of *Podaxis* we meet with other remarkable differences, certainly not so important as the above, nevertheless such as would hardly be expected in a small genus, as the presence of a copious capillitium in some species, and its rudimentary condition or total absence in others, or the difference in origin of the spores, which can perhaps be explained by assuming that the existing known species represent the two poles of a once larger genus, and some colour is given to this idea when we take into consideration the very wide geographical range combined with the comparative rarity of existing species.

I have had no opportunity of examining young spirit-preserved material of *P. carcinomalis*, but this is one of the commonest species in herbaria, and I have devoted a considerable amount of time in examining dry material in various stages of development, and I invariably find dense tufts of what I take to be asci, as represented in fig. 10; when dry, and for some time after being placed in water, the clavate bodies are shrivelled, as in fig. 4 *a a*, but after soaking for some time they become inflated, and in spite of prolonged and careful search, with, I believe, total absence of bias, I have not in a single instance caught a glimpse of anything that indicated the point of attachment of a spore at the apex of what Fischer considers to be the basidia; the apices are absolutely smooth and homogeneous, whereas in *Geaster* and several genera belonging to the *Hymenogastreæ*, where the spores are sessile on the basidia, the latter always show clearly a scar corresponding to the point of attachment of the spores. What I do find in the shrivelled bodies, after having become fully expanded, is an irregular slit in the wall, sometimes apical, sometimes slightly removed from the apex, and through this slit I assume (but in the species under consideration have no evidence) that the spore has escaped from the ascus. A final objection to the basidial nature of the clavate bodies in *P. carcinomalis*, in common with all the species, is the total absence of young spores; during the examination of material from immature specimens, I have repeatedly noticed clusters of the spore producing bodies in various stages of development, some very small, but in every instance perfectly smooth at the apex; whereas in the *Gastromycetes*, as a rule, the spores first appear at the apices of the basidia as conspicuous papillæ.

The ascosporous hyphæ, with their clusters of asci, persist in a shrivelled condition in all the species of *Podaxis*, and the spores may usually be seen adhering in clusters to the shrivelled asci, being held by some mucilaginous substance furnished by the partial disintegration of the hyphæ, and it sometimes happens that one or more spores are agglutinated to the apex of an ascus in such a position as to suggest the idea of a basidium with spores attached to its apex; but this idea is dispelled by further examination, which reveals spores agglutinated, but not organically attached to the asci in all positions, and, by their dropping away when hydrate of potash or hydrate of ammonia is run in under the cover-glass, the last-mentioned medium is very useful in soon causing expansion of the shrivelled asci in old specimens.

A very remarkable modification of the already-described ascogenous mode of spore-formation is met with in *Podaxis Emerici* Berk., where the hymenial hyphæ produce at their tips, and also laterally, short, simple branches, with very few transverse septa; this septate portion eventually gives origin to numerous obovate cells, homologous with the asci in *P. indica;* these cells, after receiving all the protoplasm from the parent-cells, are respectively cut off from communication with the latter by the formation of transverse septa at the narrow basal portion, are at first colourless, and filled with granular vacuolated protoplasm, and become differentiated into spores furnished with one (rarely two) germ-pores in the thick wall, and, while yet colourless, fall away as free spores showing very distinctly at the narrow end, the "hilum," or projecting scar, corresponding to the point of attachment to the parent-cell; the spores continue to increase in size after becoming free, and when mature are coloured olive-brown (fig. 25).

Comparing these spores with those of *P. indica*, we notice that the development is absolutely homologous up to the point of formation of the terminal obovate cells borne by the specialized septate portions of the hymenial hyphæ, then in *P. indica* the wall of the obovate terminal cell is recognised as an ascus, its protoplasm resolves itself into a spore surrounded by its own cell-wall, which in course of time escapes from the mother-cell or ascus, leaving the latter permanently attached in a shrivelled condition to the mother-cell, from which it originated. In *P. Emerici* the obovate bodies become directly transformed into spores, the original cell-wall adhering to, and forming a somewhat loose investment on the inner and thicker true wall of the spore; as the latter increases in size, the outer wall—homologous with the ascus in *P. indica*—becomes closely adnate to the inner, coloured wall, but can be readily separated by the application of sulphuric acid. When I first saw the spores of *P. Emerici*, each with its very evident hilum or point of attachment, I searched further for the basidia, as figured by Fischer in *P. carcinomalis*, each basidium bearing four sessile spores at its apex; but I am convinced from repeated examinations that in *P. Emerici* the spores, which are the homologues of spores and asci combined in *P. indica*, fall away directly from the septate mycelium. Now it is clear that the spores of *P. Emerici* cannot be called ascospores, because they are not produced in asci or mother-cells, from which they eventually escape, and, if not ascospores, they must in the broader sense be basidiospores, and, if so, the sparsely septate portion of mycelium from which they originate must be a basidium. It must not be supposed that the transition from ascospores to basidiospores is abrupt; in *P. Emerici* mixed with basidiospores, characterized by the well-marked hilum, may occasionally be seen perfectly smooth spores without any trace of a hilum; such spores are technically ascospores, having escaped from the mother-cell, contrary to the rule, and it is not rare to find spores with the outermost portion corresponding to the ascus in *P. indica*, split and partly removed (fig. 26); in fact, there is in *P. Emerici* every transition of spore-origin between what has been spoken of as ascosporous and basidiosporous respectively; furthermore, I have reason to believe that in every species of *Podaxis* there is a sprinkling of spores produced as basidiospores, that is, spores falling away with the wall of the obovate cell as a permanent external investment, instead of escaping from this wall, which then is considered as an ascus, as is most usual in all species, except *P. Emerici*, where the reverse holds good regarding the proportions of the two modes of spore-formation.

(To be continued.)

NOTES ON SCOTCH PLANTS.

By G. Claridge Druce, M.A., F.L.S.

The following notes were made on a visit to Strath Tay in 1888, and to Easterness, Banff, Elgin, and Ross-shire in 1889. The first visit was marred by wet weather and a backward season, which prevented the roses from being carefully worked. This year the visit was equally mis-timed, for I reached Scotland at the end of six weeks' drought, which had dried up the vegetation in a terrible manner, and which the continued rainfall I experienced did little to benefit. I spent two hours in Glen A'an, but got soaked shortly after reaching the rocks. There is still a good deal of work to be done on the rocks around its head and on the southern side.

Such of the following plants as are believed to be new records are marked *; personal vouchers for which authority is lacking in Top. Bot. are marked †. In a few cases I have put in some altitudinal records where these extend the range from those given in the 'Student's Flora.' It is quite probable that these have been already noted by other observers. I am indebted to Messrs. Arthur Bennett, F. J. Hanbury, F. Townsend, M.P., and Rev. W. Moyle Rogers for kind assistance.

The variety of *Ranunculus acris* L., called by Wahlenberg *pumilus* (see Journ. Bot., 1889, 204), I have had in cultivation a year; it still retains its characters. I saw a plant or two in Glen A'an, at nearly 3000 ft. *Banff, 94.

Erophila inflata Hook. f. occurred by the Loch on Lawers. It scarcely seems worthy of specific designation; an inflated fruited form of *E. præcox,* which we have in Oxfordshire, closely approaches it.

Draba incana L., as the var. *contorta* (Ehrh.), was plentiful on the cliffs of Meal Garbh, 88, and also sparingly in *West Ross, and on sand-hills in East Ross.

Arabis petræa Lamk. The glabrous cut-leaved variety from the Cairngorms retains its characters under cultivation, although it has narrowly escaped destruction from slugs, which are passionately fond of it, while they utterly neglect the Ben Laoigh plant, which also remains unaltered under cultivation. I saw the glabrous form in *Glen A'an, Banff.

Viola lutea Huds., var. *amœna* (Symons). Perhaps under this should be placed an extremely handsome form which occurred on the cliffs of Meal Garbh, notwithstanding its *tricolor* aspect. It is more correctly the var. *grandiflora* of Gren. et Godr. vol. i., p. 184; see also Vill. Cat. Strasb., which, I believe, was a yellow-flowered form.

Fumaria densiflora* DC. On rubbish-heaps, Inverness, 96.—F. capreolata* L. West Ross, 105.

**Dianthus deltoides* L. Linlithgow; v. sp. in Hort. Ox. Forfar, 90; v. sp. in Hort. Ox.

Lychnis diurna Sibth. Occurred with white flowers on Ben Lawers.

Arenaria sedoides Schultz. Ascends to at least 3600 ft. on Lawers, 88, and descends to 1800 ft. on Ben Slioch. †West Ross, forma *apetala*, 105.

†*Cerastium tetrandrum* Curtis. Nairn, 96.—**C. alpinum* L. Not the *lanatum* of Lamarck, but that pubescent lighter green plant which is, I believe, Bentham's var. *piloso-pubescens*. Loch A'an, 94.

Stellaria media Cyr., var. **major* Koch. Kinlochewe, 105.

Silene acaulis Jacq. in Hort. Vind., *var. *elongata* Gaud. Wet rocks, Cairngorm, 96.

**Hypericum Androsæmum* L. Glenelg, W. Ross, 105.

Geranium sylvaticum L. Ascends to over 3000 ft. on Lawers.—The var. *parviflorum* Blytt occurs with the type at Moness Falls, 88.

Anthyllis Vulneraria L., with hairy stems and simple lower leaves grew on the cliffs of Meal Garb.

Lupinus perennis L. Quite naturalized by the Kilmorack Falls, Beauly, 96.

Lotus corniculatus L., with large flowers and rather fleshy leaves, grew on Meal Garb. It is probably near to the var. *crassifolius;* another form with very small fleshy leaves is the prevailing plant on the moorland near the Boat of Garten and Kingussie, 96.

**Trifolium minus* Relh. Beauly, 96.

Vicia sylvatica L. grew in great luxuriance on the Den of Lawers,† 88.—**V. sepium* L. Marec, 105.

**Lathyrus pratensis* L. Boat of Garten, 96, and Kinlochewe, 105; also as the *var. *villosus* Schl. at Beauly, 96.

Geum rivale L. ascends to 2900 ft. on Lawers.

Rubus saxatilis L. reaches 2800 ft. on Lawers, and nearly the same altitude on Ben Slioch,* West Ross.

Potentilla rubens Vill. (*P. maculata* Pourr.) reaches 2800 ft. on Meal Garb.

Prunus avium L. On glebe at Glenelg, W. Ross, 105, *Miss Macdonald.*

Rosa spinosissima L. Evidently the relics of an old garden by Loch Tay at Lawers. The hispid peduncled form.—*R. mollis* Sm., var. *cærulea* (Woods). Lawers. The type ascends to 2000 ft. on Craig Cailleach. — *R. tomentosa* Sm. To this M. Crépin refers the very glandular rose which an expert had named *R. inodora* Fries; see Scot. Nat., July, 89. Gathered near Lawers Pier. Rev. W. Moyle Rogers suggested (independently) that it was a *tomentosa* form.—*R. canina* L., var. *arvatica* Baker. Lawers. —Var. *pruinosa* Baker. Lawers. — Var. *cæsia* (Sm.). Lawers. — Var. *Kosinciana* (Bess.). Lawers.—Var. *verticillacantha* (Merat). On Craig Cailleach, at 1800 ft.—Var. *glauca* (Vill.). Spey Side, Easterness, 96. *Kinlochewe, 105.—Var. *subcristata.* Beauly, 96. Kinlochewe, 105.—*Var. *celerata* Baker. Beauly, 96.

Rubus pyramidalis* Kalt. Beauly, 96.—R. calvatus* Blox. Kinlochewe, 105.—**R. affinis* W. & N. Kinlochewe, 105.

Spiræa Ulmaria L., var. *discolor* Koch. Reaches 2900 ft. on Lawers. This form was noticed in West Ross also.

Epilobium montanum L., forma *minor* Haussk., occurred at Aberfeldy and in Den of Lawers, 88; also by Gleann Bianasdail, in West Ross, 105. A form of *montanum* with very small flowers and repeatedly branching stem (probably owing to the attacks of an Aphis) also occurred. The large branching form plentiful by the road-side at Killin and Lawers Professor Haussknecht has not separated from the type, nor does he specially name the dark red-flowered form, which is not infrequent in some localities. The form (var. *verticillatum* Koch) occurred at Aberfeldy, as also the form *umbrosa* Haussk.—**E. obscurum* × *palustre* Haussk. By the road-side at Lawers, and at Kinlochewe, West Ross.—**E. obscurum* × *parviflorum* Haussk. Kinlochewe, West Ross. — **E. obscurum* Schreb. Beauly, 96.

Callitriche hamulata Kuetz., in a starved form, reaches 2700 ft. on Lawers.—**C. platycarpa* Kuetz. 95, 106.

**Lythrum Salicaria* L. In a marsh near the Muir of Ord, rare, 96.

Sedum villosum L. On Lawers at 3000 ft.

Ribes Uva-crispa L. Lawers.—*R. Grossularia* L. Beauly, 96.—*R. alpinum* L. Kenmore, probably an escape, 88.

Saxifraga quinquefida Haworth. Lawers, 88, *teste Engler.*—**S. grœnlandica* L. = *S. decipiens* Ehrh., var. *grœnlandica* (L.). *Teste* Prof. Engler, who tells me he had noticed it there. I gathered it in small quantity on the east side. It is an intermediate between *cæspitosa* and *hypnoides*, which I took to be identical with the Welsh plant, but submitted it to Prof. Babington, who says:—"Not *cæspitosa; can it be *Sternbergii?*" Prof. Engler names it as above. It has not previously been recorded for Scotland.

Hydrocotyle vulgaris L. The floating form occurred at the head of Loch Maree, 105.

Galium palustre L., var. *Witheringii* (Sm.). Loch Tay Side.—*G. boreale* L. ranges from 340 to 2900 ft. in Perth.

†*Cornus suecica* L. Sgurr, on Suill Bhain, 105.

Hieracium prenanthoides Vill. Reaches 2600. ft. on Lawers.—*H. anglicum* Fr. Ascends to 2800 ft. on Lawers. — *H. lingulatum* Backh. Ascends to 2600 ft. on Ben Eay, and 2900 ft. on Ben Slioch, W. Ross, 105.—*H. eximium* Backh. Loch A'un, 94.—**H. holosericeum* Backh. Ben Eay, 105. — **H. nigrescens* Fries. Ben Slioch, 105.—*H. gracilentum* Backh. Loch A'an. — *? H. globosum* Backh. Ben Eay. Probably this, 105.—*H. alpinum* L. "Probably, but I cannot speak positively of such a poor specimen," *F. J. H.* Two only were seen much over flower. I believe them to be *alpinum*. Ben Eay, West Ross, 105.

**Serratula tinctoria* L. I saw a plant collected by Miss McDonald at Nairn, 96. How far native I cannot say.

**Arctium intermedium* Schk. Beauly, 96.

Senecio Jacobæa L. A form of this with very narrow ligules occurred at Beauly, 96. It looked very different from the type.

Antennaria dioica Gaertn. Ascends to 2800 ft. on Lawers.

Cnicus lanceolatus Willd., *var. *nemorale* Reichb. Kinlochewe, 105.

Tussilago Farfara L. Reaches 2800 ft. on Lawers.

Achillea Millefolium L. A very downy form of this grew in Glen Bianasdail, W. Ross.

Crepis paludosa Moench. Grows at 2700 ft. on Lawers.

**Aster Tripolium* L. Beauly Side, Easterness, 96, and also the form (var. *discoidea*).

Solidago Virgaurea L. 3000 ft. on Lawers, as the var. *cambrica* (Huds.). On Ben Slioch, W. Ross, where the narrow-leaved form also occurs.

Campanula rotundifolia L., var. *lancifolia* Koch. A very beautiful form with large flowers on the rocks in Glen A'an, 94. *The type in Kintail, 105.

Schollera Occycoccos Roth. Grows near Loch Chait, on Lawers. The name Cranberry is given in Easterness to the fruit of *V. Vitis-idæa*, where it is extensively collected for preserving.—*V. uliginosum* L. Ben Eay, 105.

**Pyrola media* L. 105. V. sp.

Vinca minor L. Occurs as an escape at Kenmore, 88.

Convolvulus sepium L. Perhaps only naturalized, 96.

Veronica alpina L. Ascends to 3800 ft. on Lawers. — *V. montana* L. Occurs at Aberfeldy. — *V. arvensis* L. Was noticed at 2700 ft. on Lawers. — *V. fruticans* Crantz. In beautiful flower on Meal Garb.

Melampyrum pratense L., var. *hians* mihi. In the Rep. of Ex. Club, 1889, I stated that I thought I saw this from the rail near Grantown, Easterness. This year I verified the record, but the locality is in Elgin. Later on I found it is the prevailing plant by the beautiful falls of Kilmorack, near Beauly; a new county record, 96*.

Rhinanthus minor Ehrh. A small form, which Rev. E. S. Marshall has already alluded to, is common at the base of Ben Slioch, 105.

Euphrasia officinalis L., var. *gracilis* (Fries). Occurred on Ben Lawers, 88, and by GleanBianasdail, 105; and a large-leaved plant from Ben Lawers, 88, and near Loch Torridon, 105. Is named *E. Rostkoviana* Hayne by Mr. F. Townsend.

**Lycopus europæus* L. Kintail, 105.

Galeopsis Tetrahit L., var. *bifida* (Boenn.). Occurred with the beautiful *G. speciosa* Miller, at Lawers, 88.

Thymus Serpyllum L. A large handsome-flowered form grew on Lawers. Another form with large glabrous leaves ascends to 2800 ft. on the same hill.

**Stachys palustris* L., var. *canescens* Lange (*S. segetum* Hag.). A densely hairy variety occurred at Kinlochewe, 105, in cultivated fields, with the type.

Myosotis alpestris Schmidt. Descends from near the summit of Lawers nearly to Loch Chait, at 2400 ft.—*M. repens* Don. 96, 105, 106.—*M. palustris* L., var. *strigulosa* Reichb. 96.

Lysimachia nemorum L. Flowers at 2700 ft. on Lawers.

Anagallis tenella L. A small patch by Tay Side pointed out to me by Miss Low. A rare plant in Mid Perth.

**Primula veris* L. Boat of Garten, 96, *Miss Sangster.*

**Atriplex erecta* Huds. Beauly, 96.

Urtica dioica L. Grew at 2700 ft. on Lawers.

Polygonum Persicaria L., *var. *elatum* Gren. et Godr. Beauly, 96. —*P. Aviculare* L., var. *rurivagum* (Jord.). Boat of Garten, 96.

Mercurialis perennis L. Occurs at 3300 ft. on Lawers. *Kintail, 105.

Salix herbacea L. Summit of Ben Eay, 105. — *S. Arbuscula* L. Descends to 400 ft. at Lawers.—*S. viminalis* L. Beauly, 96.

**Quercus sessiliflora* Salisb. Beauly, 96.

**Betula odorata* Bechst., var. *parvifolia* (Wimm.). Kinlochewe, 105.

**Goodyera repens* Br. Coul Woods, 106.

Tofieldia palustris Huds. Grows at 2700 ft. on Lawers.

Sparganium natans L. et auct. var. (non Fries) = *S. affine* Sch. At 2200 ft. on Ben Slioch, W. Ross, 105.

Luzula maxima DC. Was noticed at 2800 ft. on Lawers.

Juncus triglumis L. Reaches 3300 ft. on Lawers.

Eriophorum angustifolium Roth., *var. *minus* Koch. On Ben Slioch, W. Ross, 105.—*Var. *Vaillantianum* (Poit. et Turp.). Kinlochewe, 105.

Scirpus pauciflorus Light. Tall specimen (18 in.) by Beauly Firth, 96.—**S. maritimus* L. Beauly Firth, 96.—*Var. *conglobatus* Gray. Loch Duich, 105.

Carex pulicaris L. Ascends to 2900 ft. on Lawers.— **C. limosa* L. Skye; v. sp. in Hort. Ox. Not quite typical, slightly reverting, as it does, to *C. magellanica* Lamk. — **C. paniculata* L. Gleann Bianasdail, W. Ross, 105.—*C. Goodenovii* Gay, var. *juncella* (Fries). Ben Laoigh, Mid Perth, 88. Kinlochewe, 105. — Var. *melæna* (Wimm.). Ben Eay, 105. — Var. *curvata*. Boat of Garten, 96.— *C. stolonifera* Hoppe antedates Gay's name, but it was applied by Hoppe to a small form.—*C. binervis* L., forma *nigrescens* mihi, which is, I think, worth even a varietal name. It is the blackish-fruited form frequent in mountain localities, and appears in its most typical state on the cliffs of Glen Callater, 92, where it has much the appearance of *C. frigida.* It has also been noticed on Ben Laoigh, 88, 98; Glen Ennich, 96; Ben Eay, 105; and is probably generally distributed. It is certainly connected with the type by an almost unbroken series of forms. — Forma *elatior* is the large moorland state occurring about Torridon, &c., 4 ft. high, with large, rather conical than cylindric spikelets. It is occasionally confused with the following species.— **C. lævigata* Sm. Skye, Hb. Ox. sub nom. *binervis.* — *C. flava* L. var. *Œderi* Lilj. Kinlochewe, 105. Our old *C. flava* var. *lepidocarpa* auct. ang. non Tausch. = var. *minor* Towns. The latter name in any case cannot be retained, as Ledebour in Flor. Ross reduced *C. Œderi* Ehrh. to var. *minor* Ledeb. I have not seen Ledebour's specimens, so do not know whether they refer to this var. or to the *C. Chrysites* of Link. The matter is well worth investigating, as it is possible that Ledebour's name may have to replace that of var. *cyperoides* Marss., suggested by Prof. Bailey in his excellent paper.—*C. flava* L. Under this I put a sedge gathered on Ben Laoigh, already referred to in Journ. Bot., Jan. 1889, and which I call *flava* × *saxatilis.* I hope to obtain Dr. Lange's opinion on it shortly. — **C. cryptocarpa* Meyer, var. *Kattegattensis* (Fries). I am not quite certain whether this is the correct name, but at any rate the plant is identical with the Caithness specimen (*teste Mr. Arthur Bennett*). I was glad to get this recent addition to our flora in a second Scotch locality, *i. e.*, by the Beauly Frith, 96. It occurred only sparingly, and was in bad condition, from the tidal refuse. The yellowish colour of the foliage at once attracted my attention to it.

**Deyeuxia neglecta* Kunth, var. *borealis* (Hartman sub *Calamagrostide*). This addition to the British Flora was found in Mid Perth, 88, in August, 1888, growing in a small marsh over a limited area.

It was first described by L. Læstadius as a species, i. e., *Calamagrostis borealis*, in 'Anamärkningar om Vegetationem i Karesuando och Enontekis.' I am indebted to Mr. Arthur Bennett for a copy of the following description:—"Arista subdorsali, lana corolla brevior, caulis foliatus. Panicula stricta patens, folia radicalia dilatata, aspera, stricta, elongata. Cum *C. stricta* maximam similitudinem habet. Differt autem arista subdorsali, hoc est infra apicem, supra medium corollæ fixa, brevissima; pilis corollam non æquantibus; longiora autem quam strictæ. A *C. epigejos*, cujus formam depauperatam primum putavi, differt glumis duplo brevioribus non acuminatis, et a *C. strigosa* eadem nota." When I gathered it, a specimen was at once sent to Mr. Arthur Bennett, and, in answer to my query if *stricta*, he replied, "Yes, or *borealis*"; and later on leaned to the latter name, which has been kindly decided by Prof. Hackel. So far, it appears to be recorded for Europe only for Finmark, Lapland, West Bothnia. It has also been found in Greenland. Its Scotch locality is a wide extension of its range. If considered as a *D. neglecta*, it is even then a rediscovery for Scotland, since the marsh near Forfar where George Don originally found the plant so-named has been dredged, and the plant lost about the time that *Eriophorum alpinum* ceased to exist.

**Phragmites vulgaris* Trin., as the var. *uniflora* Dum. In Kintail, 105.

Alopecurus geniculatus L. A glaucous form grew at Kinlochewe, 105.

**Phleum pratense* L. Dingwall, 106.

Holcus lanatus L. Ascends to 2200 ft. on Ben Slioch.

Agrostis canina* L., var. *scotica* Hackel *in lit.* *A. canina* L. occurs abundantly as a large-flowered moorland plant about the base of Ben Eay, W. Ross, 105, and is plentiful on the mountain itself. At about 1500 ft. elevation it is accompanied with, or replaced by, a dwarfer plant, which is found not only upon the quartzite screes, but also on the summit-ridges. This plant puzzles me not a little, and to see it in good condition was the special object of my northern tour. I gathered a good series, and even then felt undecided whether to put it under *A. rubra* Wahl. or *A. canina*. Specimens were sent to Prof. Hackel, and he kindly wrote:—"Your *Agrostis* is in some degree intermediate between *A. canina* and *A. rubra* (the existence of such intermediate forms has already been mentioned by Berlin (Ofvers. Stockh. R. Acad. Förhandl. 1887, p. 71), but he gave no name to any of them. I should like to name your *Agrostis A. canina* var. *scotica*, and, like *A. canina*, it offers two subvarieties, i. e., *aristata* and *mutica*. The true *rubra* differs from it by its *flat* radical leaves, strongly-tufted growth, without runners, &c. From *A. canina genuina* your var. *scotica* differs by the lower culm, much greater spikelets, depauperate panicle, &c." The awnless form was as frequent as the type. The plant was abundant, and ascended to 3000 ft. *A. canina* is stated in the 'Student's Flora' to ascend to 1500 ft. in Derby. The same plant occurred, although much less frequently, on Ben Slioch, but its comparative scarcity on that mountain may be explained that the former is forest, the latter a sheep-farm. With the large-flowered moorland form in W. Ross appeared fully typical *canina*, but the florets were in all cases darker-coloured. I believe, in Parnell's 'Grasses,' there is a plant labelled var. *alpina* from Clova similar to the var. *scotica*.‡—*A. canina* L., var. *mutica*. A slender shape, grown form appeared by the Kilmorack Falls, 96.—*A. alba* L., var. *stolonifera* (L.). Beauly, 96. — *Var. *coarctata* Hoffm. Beauly, 96. — *Var. *maritima* Meyer. Culbin Sands, 95. Nairn, 96. — *Var. *gigantea* Meyer. Near Beauly, 96. Near to *A. nigra* With. — *A. vulgaris* With., var. *pumila* (L.). Appeared to be free from disease on Lawers. A small alpine form of *A. vulgaris* With. grew on dry rocks in Glen A'an, 94.—A. nigra* With. Fields near Beauly, 96.

Sesleria cærulea Hardueni. Reaches 2800 ft. on Lawers.

Deschampsia cæspitosa Beauv., var. *alpina* Gaud. The stunted compact form with short leaves and larger florets, so common on the upper table-land of the Cairngorms (the var. *brevifolia* Parnell), in one year's cultivation has changed to a robust plant 3 ft. high, presenting little difference from the type, except in its shorter leaves and slightly larger florets. The viviparous form was frequent on Lawers.—*Var. *pallida* Koch. Near Kinlochewe, 105.

Poa glauca Sm. Descends to Lawers Bridge (400 ft.), on which are some stunted plants. Between this species and *P. nemoralis* a great number of intermediates occur, which Prof. Hackel says it is impossible to name. — **P. Balfouri* Parn. The correct spelling. Cliffs of Glen Ennich, very rare, 96.—**P. nemoralis* L., var. *divaricata* Syme. Craig Cailleach, 88.— **P. cæsia* Smith. This intermediate of *P. nemoralis* and *P. glauca* Prof. Hackel names as above. It grew on cliffs above Loch Chait, Ben Lawers. In Eng. Bot. Dr. Boswell-Syme says he had seen no wild British specimens.

**Glyceria maritima* Wahl. Nairn, 96.

Agropyron repens Beauv., var. *Leersianum* Gray. Base of Ben Lawers, 88. Dingwall, 106. Kinlochewe, 105. The glaucous form occurred at Beauly, 96. It is probably the var. *cæsium* (sub *Triticum*) of Döll. Fl. Bad.—**A. junceum* Beauv. Nairn, 96.

Festuca ovina L., var. *genuina* Hackel. Cliffs of Ben Eay, 105. —**F. rubra* L., var. *lanuginosa* Mert. et Koch. Culbin Sands, Elgin, 95. Nairn, 96.— *Subvar. *barbata* Hack. Ben Laoigh, 88, 98. Lawers, 88. A depauperate form occurred by the Abhuinn Bruachaig, and a rigid glaucous form by Loch Maree, 105. — *F. pratensis* Huds. Beauly, 96.

**Athyrium flexile* Syme. This rare and interesting form I gathered on the Cairngorms (96) last year, and have it in cultivation. Although not quite identical with the Ben Aulder plant, Dr. Buchanan White agrees with me in placing it under this name. The Ben Aulder plant, he tells me, is slightly stouter and more oblong in outline, and narrower in proportion to its length. It is true that my cultivated specimens suffered this year from being kept too dry. These fairly agree with Backhouse's specimens from Glen Prosen.

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‡ I have since examined the specimen in the Parnell Herbarium, and find my supposition to be correct.

Polypodium vulgare L. Grew on Ben Lawers at 2800 ft.

Lycopodium alpinum L., var. *decipiens* Syme. Ben Lawers, 88. Ben Eay, 105. — *L. Selago* L., var. *recurvum* Desvaux. Another instance where Syme's name is given in error. Kinlochewe, 105.

Equisetum sylvaticum L., var. *capillare* Hoffm. Lawers, 88. Kinlochewe, 105.

ON *FESTUCA HETEROPHYLLA*, &c. Lam.

By the Rev. E. S. Marshall, M.A., F.L.S.

On page 217 of this Journal for 1889, Mr. Carruthers gave his reasons for doubting the occurrence of this grass as indigenous in Britain. I have already (pp. 249, 250), made some answer to these, with reference to the question of climate and geographical distribution; and an examination of the works and plates to which he refers has led me to attempt a review of the evidence. It appeared desirable to have Dr. Hackel's opinion on the probabilities of the case, and the following is a translation of his reply to my question:—

"I have read Mr. Carruthers' article in 'Journal of Botany,' but am not at all of his opinion. I most decidedly dispute [the assertion] that this species has ever been cultivated on any large scale for agricultural purposes; nor do I believe that its seeds are to be obtained anywhere in the trade. What is, and has been, taken for it has probably always been merely *F. rubra*, var. *fallax*, which has, indeed, continually been confused with *heterophylla*. *F. heterophylla* is a regular *wood*-grass (ein ächtes *Wald*-gras), quite unsuited for agricultural purposes; for, if it is cultivated in a sunny spot (as, for example, a meadow), at the flowering season it has no living offshoots (Innovations-blätter) left, since they then quickly die off and turn brown. Thus the yield would be very small. This grass is also not pleasant to cattle, on account of the roughness of its leaves." The concluding remark quite tallies with my own observation of this harsh-textured plant.

Mr. Carruthers states that "it was known to George Sinclair in the beginning of this century." I submit that this assertion is not tenable, on Sinclair's own showing. The specimen inserted in the folio edition (1816) as "*Festuca ovina hordiformis*," is very incomplete, but is most certainly *not F. heterophylla* Lam. In my opinion, the flower-head is that of a *rubra*-form, approaching var. *fallax*, and perhaps identical with it. Of his plant he says:—"Its nutritive qualities are nearly the same as those of the *Festuca duriuscula* [probably what we now call *rubra*, *genuina*]. It is superior to that species, and to most others, in the produce of early herbage in the spring; the herbage is very fine, tender, and succulent. It is highly superior to the *Festuca ovina*, of which it is considered a variety . . . . It flowers the last week of May, and ripens the seed in June." I had *F. heterophylla* constantly under observation from February to July last, and can affirm that neither in the quality of its spring herbage, nor in its time of flowering and fruiting, does it agree with the above. Even in an early season, its flowers did not begin to expand before the middle of June; and its seed was not ripe till more than a month later. It is here more backward than either *F. ovina* or *F. rubra.* In the 8vo edition of 1824, as stated by Mr. Carruthers, "a very good plate is given"; but the plant represented by it is neither *heterophylla* nor the *rubra*-form of 1816, but *F. ovina*, var. *vulgaris* Koch. I could match the figure with shade-grown specimens so named by Dr. Hackel, collected last summer at Witley.

I next come to Mr. M. J. Sutton's work (1886), of which, by the courtesy of Messrs. Sutton, a copy is before me. The short description is correct, as far as it goes, but would equally well apply to *rubra fallax;* and one who knew the capillary-triangular root-leaves of *heterophylla* would scarcely describe them simply as "folded." The accompanying figure bears *not the faintest resemblance* to the true plant, either in leaves, habit, or inflorescence, and is in marked contrast to the general excellence of the plates. The statement about its introduction in 1814 evidently points to Sinclair's book; and the remark that it is "particularly suited to pastures, on account of its large bulk of herbage," is also very suggestive of error.

Messrs. Carter's figure I have not succeeded in seeing, but this is immaterial, as they expressly state, in sending me a seed-sample, that it "is the *F. heterophylla* of commerce and a giant variety of *Festuca duriuscula* or Hard Fescue."

Messrs. Webb's figure is as unlike the real plant as is Messrs. Sutton's. They remark that "it produces a large quantity of foliage, which is broad and succulent, and of a fine dark green colour. Hence, like Sheep's Fescue, it is well adapted for lawns." This is certainly not true of *heterophylla*, which grows in compact tufts (almost "tussocks").

I wish to express my best thanks to the three leading firms mentioned above, for their prompt help and liberal gift of seeds, which I hope to grow experimentally.

Dr. Stebler stands alone in figuring the genuine plant of Lamarck. With reference to its alleged culture in England, he expressly says:—"It is very probable that the four varieties mentioned above are in reality forms of tufted red fescue (*Festuca rubra fallax* Hackel). The tufted red fescues are often regarded as varieties of various-leaved fescue." He states that commercial seed is rarely genuine, *F. fallax* being usually substituted for it, but mentions two German houses and one in Paris from which he has obtained it. Messrs. Sutton write to me as follows:—"The true *F. heterophylla* is very seldom offered in the trade. We used to sell considerable quantities, but lately have been unable to get sufficient seed, really true, to make it worth while offering it in our catalogue." As, however, they maintain that Mr. Martin Sutton's figure "was certainly *Festuca heterophylla*, . . . a very luxuriant specimen grown on soil suitable to it," their opinion seems to me of small value, either way; and I greatly doubt their having ever had the right thing.* Dr. Stebler states that "gardeners use various-leaved fescues for borders, &c.," but does not say whether the plant intended is *fallax* or *heterophylla*. Mr. Carruthers kindly showed me the original work, as well as the English translation, and I take the following remark from that:—"It is said, if sown in the open, to come up, but to be much less vigorous, and to quickly fall off in its yield, as Langethal . . . mentions."

I have seen a specimen of Mr. Brotherston's plant from near Kelso, referred to by Mr. Britten at p. 272, and consider it to be rightly named, though the specimen is scanty. Its occurrence as a true native in Scotland is most improbable, and the locality (roadsides) is suspicious in itself.

On the whole, I think the evidence quite insufficient to justify Mr. Carruthers' statement (*l. c.*):—"That the plant has been in cultivation for over seventy years, and that the seed can be purchased at any seedsman's for a small price per pound, cannot be doubted." In fact it *is extremely doubtful whether true seed is procurable at all in this country*. Yet it is a very ornamental grass, and one which might well be used for the shaded parts of a garden, or for ornamental plantations; and its occurrence at Kelso may be due to such a cause, or to mere accidental introduction. Even if it were a species largely cultivated, *that would not militate against its being a true native, as well.*

A friend whose opinion I estimate very highly has questioned the Witley station, on account of the immediate proximity of rhododendrons and other planted things; but I have not found a single root of the *Festuca* growing under them. The soil on which it occurs seems to have been little, if at all, disturbed; and its companion-grasses are all native. These are *F. rubra*, *F. ovina*, vars. *vulgaris* and *capillata*, *Dactylis*, *Poa nemoralis* and *P. pratensis*, var. *angustifolia*. My own decided opinion, after carefully balancing the probabilities, is still in favour of its being equally native with the rest. The Hants station so far as my memory serves me, is not open to the same objection, on the ground of introduced neighbours. I believe that the species, if looked for, will be found in many parts of Southern England, though very likely of *local* occurrence. Mr. Druce appears to think it a probable native in his Oxfordshire locality.

In Dr. Hackel's 'Mon. Fest. eur.,' (p. 130) *F. heterophylla*, this plant is placed as a subspecies of *F. rubra*. In my humble opinion, it has quite as strong claims to specific distinctness as either *rubra* or *ovina*; and the learned author himself wrote to me, on its first discovery, that "he must admit never having found any certain transitional forms; a fact tending to justify the specific separation." It may be desirable to give his description of the grass, as the monograph is not widely known in this country:—

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* Since this paper has been in the printer's hands, Messrs. Sutton have sent me a plant of the true *F. heterophylla*, grown on their trial grounds in 1886. They add: "We have many years sold seed quite as true as that which we sent to you, but lately it has been so much mixed with *Aira flexuosa* that we have been unable to separate it and, therefore, could not offer it."—E. S. M.

"Char. *Dense cæspitosa, innovationes pleræque intravaginales,* interjectis paucis extravaginalibus *non repentibus. Laminæ obtusæ, valde difformes, innovationum arcte complicatæ, capillares, trigonæ, superiores 3-nerves, intus depresse—1-costatæ, fasciculis sclerenchymaticis 3-inferioribus instructæ, absque cellulis bulliformibus,* foliorum *culmeorum* multoties latiores, *planæ,* 7–11-nerves, *superne elevato 5–7-costatæ, fasciculis sclerenchymaticis et superioribus* singulis nervis marginibusque correspondentibus, *cellulisque bulbiformibus instructæ. Ovarium apice hispidulum.*

"Descr. *Culmi elati* (ad 60 cm. et ultra), sæpius *3-nodes,* nodo summo in $\frac{1}{3}$—$\frac{1}{2}$ culmi sito, superne teretes, striati, læves. *Vaginæ foliorum innovationum trigonæ,* læves v. scaberulæ, 3–5-nerves, tenues, cito marcescentes, emarcidæ fuscæ, *demum parce fibrosæ.*

"*Laminæ innovationum* 0.4—0.6 mm. diam., etiam vivæ arctæ complicatæ, longissimæ, *flaccidæ, molles, læte virides,* angulis plerumque scabræ, (saltem parte suprema), acute carinatæ, sectione, transversa deltoideæ, foliorum culmeorum 2–3 mm. latæ, superne pubescentes. *Panicula major (6–16 cm. lg.) ovata, laxiuscula,* anthesi patens, apice sæpe nutans, rhachi scrabra, ramis inferioribus 2–3 nis, primario dimidiâ paniculâ plerumque longiore, a $\frac{1}{3}$-spiculiferis.

"*Spiculæ lineari-oblongæ,* 8–10 mm. lg., remote 3–9-flores, virentes v. violaceo-variegatæ. *Glumæ* steriles inæquales v. subæquales, acutissimæ, carina scabræ, *IIda subulato-lanceolata,* 3-nervis, nervis lateralibus supra medium excurrentibus, ad $\frac{2}{3}$–$\frac{3}{4}$ v. ad apicem IVae pertinens, *fertiles lineari-lanceolatæ* 5—6, 5 mm. lg., longe acutatæ, ad medium dorsum usque carinatæ, costis lateralibus 2 prominulis notatæ, glabræ, versus apicem plerumque scabræ, ex apice aristatæ, arista glumam dimidiam æquans v. superans, interdum totam æquans. Palea lineari-oblonga, apice integra v. brevissime bidenticulata, carinis scabra" (page 130).

Besides the typical form (that found in Britain), subvarieties *leiophylla, vulpioides* (*F. vulpioides* Schur.), and *puberula* are mentioned (p. 131).

This may be a suitable opportunity for pointing out that the *Festuca* list in the 'London Catalogue,' ed. viii., needs some revision. There are two different plants under the one name of *F. loliacea* Huds.; and *F. fallax,* if retained as a species at all, is of Thuillier, not of Hackel. Its reduction to a var. of *rubra* seems, from an examination of specimens named by Dr. Hackel, to be more agreeable to facts (*vide* Mon. p. 142). The census-number of *F. duriuscula* auct. angl. (*F. rubra, genuina,* of Hack. Mon.). appears to have been transferred bodily to *fallax,* which is, on present knowledge, a decidedly rare British plant. Among a large series of Surrey forms, I have not succeeded in discovering it; and a friend's experience was, I understand, the same. "*Eu-rubra*" will doubtless prove to be common in every one of the 112 Watsonian vice-counties. Is anything definite known of *F. dumetorum* L. (reduced in Hack. Mon. to a subspecies) as an English plant?

Festuca arundinacea Schreb., var. (nova) *dubia* (*ad interim*) Hackel *in litt.* Dry slopes of the coast near Steephill, I. of Wight!

Dr. Hackel gives the following description :—" Differt a typo panicula depauperata, ramo primario imo trispiculato, secundario 1–2-spiculato (ut in *F. pratensi*, a qua differt foliorum structura, formaque spicularum)"; and adds, "It would be very desirable for you to cultivate this doubtful plant, as only then can we learn whether it is worth while to give it a special name. In any case it is very near the *F. arundinacea* subv. *strictior*, Hack. Monogr." I gathered a plant, not far off, which is assigned to this subvariety, answering to the figure of "*F. elatior* a. *genuina*" in Syme, E. B. (*fide* Hackel, l. c., p. 154). Its description is :—"Laminæ angustiores (3–5 mm. lat.) et breviores, rigidæ, siccando subconvolutæ, ligulæ manifestiores. Panicula brevior (usque 15 cm. lg.), stricta, vix nutans, ramis patulis strictis, post anthesin contracta. Spiculæ precedentis [*i. e.*, "subvar. *vulgaris*"].

As I may not soon revisit the neighbourhood, I think it better to publish the form in question, in the hope that a local botanist may further investigate the matter. My knowledge of *F. arundinacea* does not warrant any definite opinion.

In conclusion, I beg leave to acknowledge my great obligation to Prof. Hackel, and to thank the staff at the Natural History Museum for help in looking out references, &c.

WILLIAM RAMSAY McNAB.

William Ramsay McNab, M.D., who died in Dublin very suddenly of heart disease, on December 3rd, 1889, was born on the 9th of November, 1844, in Edinburgh, where his grandfather and father in succession held office as Curators of the Botanic Garden.

Dr. McNab obtained the degree of Doctor of Medicine in the University of Edinburgh when 22 years of age. Even while an undergraduate he was appointed assistant to the late Professor Balfour, who then held the Edinburgh Botanical Chair; he also studied botany under Professors Braun and Koch, and pathological anatomy and histology under Professor Virchow in Berlin.

After three years of medical practice he was appointed to the Professorship of Natural History in the Royal Agricultural College, Cirencester, and thenceforth devoted himself entirely to botany. Two years later he succeeded to the Chair of Botany in the Royal College of Science, Dublin, which he held until his death. The position of Scientific Superintendent of the Royal Botanical Gardens was created for him by the Science and Art Department in 1880. He was Consulting Botanist and Entomologist to the Royal Dublin Society, Extern Examiner in Botany, Victoria University, and was in 1888 appointed Swiney Lecturer on Geology in the British Museum. In 1877 he became a Fellow of the Linnean Society.

Professor McNab made numerous contributions to science, especially on the morphology and physiology of plants. The Royal Society's 'Catalogue of Scientific Papers' enumerates 33 of these, published between 1866 and 1875, and he continued to add to their number until his death. Contributions from his pen will be found in this Journal for 1871 and 1873. Among his papers may be mentioned:—"Experiments on the Movement of Water in Plants," published in vol. xxv. of the 'Transactions of the Royal Irish Academy' (1874–5); "On the Development of the Flowers of *Welwitschia*" (Trans. Linn. Soc. xxviii. (1873)).

He was the author of two popular botanical text-books, 'Outlines of the Morphology and Physiology,' and 'Outlines of the Classification of Plants,' published in 1878; and also wrote the scientific 'Guide-book to the Botanic Gardens at Glasnevin.' During the last seven years of his life he was engaged on a large text-book of botany, and actively occupied with researches on subjects connected with this work.

Dr. McNab had a wide acquaintance with modern botanical literature, both English and foreign, and was an expert alike in the systematic, structural, and physiological aspects of botany. He, in 1871, was the first to introduce into England the methods of teaching botany practised abroad. His style as a lecturer was precise, lucid, and simple, and his laboratory instruction was of the highest order.

His zeal for his subject was so great that he voluntarily trebled his work at the Royal College of Science, in order that students who had entered for the examinations of the Royal University of Ireland might receive the best possible instruction. In order to devote more energy to this work, he resigned other engagements, one of which was the Chair of Botany in the Carmichael School of Medicine.

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.

By James Britten, F.L.S., and G. S. Boulger, F.L.S.

(Continued from p. 22.)

Morton, Rev. John. B.A., Camb., 1691. M.A., 1695. F.R.S., 1703. Rector of Oxendon Magna, Northants, 1706. Correspondent of Ray, Sloane, Llhwyd, and Woodward. 'Nat. Hist. of Northamptonshire,' 1712 (Plants, pp. 360–407). Copy, with his MS. notes, in Bibl. Mus. Brit., press-mark, 443, i, 10. Contrib. to R. Syn. Pult. i. 354; Rich. Corr. 85; Nich. Illustr. i. 326.

Moseley, Harriet (fl. 1836–1867). Of Malvern. 1922 Drawings of British Plants (1836–1867) in Dept. of Botany, Brit. Mus. Contrib. to Lees' 'Botany of Malvern,' and to Leighton's 'Flora of Shropshire.' Lees, 'Bot. of Worcester,' xc.

Mosely, Walter Michael (fl. 1792). Of Glashampton, Worcestersh. Sent plants to Eng. Bot. (494, 1005).

Motley, James (fl. 1847–1855). Murdered in Borneo by Mohammedan settlers. Of Aberafon, Glamorganshire, and afterwards of Labuan. Contrib. to Phyt. ii. (1847) and Journ. Bot. 1847, and Carmarthen plants to Top. Bot. (551). Collected in Malaya, 1852–1855. 'Contrib. to Nat. Hist. of Labuan' [with L. L Dillwyn], 1855. Plants at Kew. Linn. Trans. xxiii. 157; R. S. C. iv. 495. *Barclaya Motleyi* Hook. f.

Mudd, William (1830–1879): b. Bedale, Yorkshire, 1830; d. Cambridge, 1879. A.L.S., 1868. Curator, Cambridge Bot. Gard., 1850?–1879. 'Manual of Brit. Lichens,' 1861, and 3 fasciculi of 100 specimens each. Pritz. 226; Jacks. 243; R. S. C. iv. 502; Gard. Chron. 1879, 558; Journ. Bot. 1879, 160; Trans. Bot. Soc. Edinb. xiv. 40.

Mudie, Robert (1777–1842): b. Forfarshire, 28th June, 1777; d. Pentonville, London, 29th April, 1842. Journalist. 'Botanic Annual,' 1832. 'Gleanings of Nature,' 1838. Pritz. 226; Jacks. 471; Hœfer; ? R. S. C. iv. 502.

Munby, Giles (1813–1876): b. York, 1813; d. Farnham, Surrey, 1876. Gold Medallist, Edinb. Univ. Orig. Memb. Bot. Soc. Edinb. Pupil of Adrien de Jussieu. 'Nat. Hist. of Dijon,' Mag. Nat. Hist. 1835, 113. In Algeria, 1839–1843. 'Flore de l'Algèrie,' 1847. 'Catologus,' 1859, ed. 2, 1866. Distributed fasciculi of Algerian plants. Herb. at Kew. Pritz. 228; Jacks. 585; R. S. C. iv. 542; viii. 470; Gard. Chron. 1876, i. 539, and, with portr., ii. 261; Trans. Bot. Soc. Edinb. xiii. 13; Journ. Bot. 14, 160. Portr. at Kew. *Munbya* Pomel = *Psoralea*. *Munbya* Boiss. = *Macrotomia*.

Munford, Rev. George (c. 1794–1871): b. Great Yarmouth, Norfolk, c. 1794; d. East Winch, near Lynn, Norfolk, 17th May, 1871; bur. East Winch. Of Magdalen Hall, Oxon. Vicar, East Winch, 1849. 'Flowering Plants of W. Norfolk,' Ann. & Mag. viii. (1841), 171. Botany in White's Hist. Norfolk, 1863. 'Local Names in Norfolk,' 1870. R. S. C. iv. 544; Trans. Norf. Norw. Soc. 1872, 12.

Munro, Donald (d. 1853): b. Scotland; d. 2nd April, 1853. Gardener under G. Don. F.L.S., 1821. Gardener to Hort. Soc. Proc. Linn. Soc. ii. 237; R. S. C. iv. 545.

Munro, William (c. 1816–1880): b. Druidstoke, Gloucestersh., circ. 1816; d. Montys Court, Taunton, 29th Jan. 1880. General, 39th Regt. C.B. F.L.S., 1840. Collected in Madras, Bengal. and Himalaya. 'Bambuseæ,' Linn. Trans. 1870. 'Timber Trees of Bengal,' 1847. 'Himalayan Primroses,' Garden, 1879. Herbarium and MSS. at Kew. Pritz. 228; Jacks. 451; R. S. C. iv. 545; viii. 471; Journ. Bot. 1880, 96; Gard. Chron. 1880, xiii. 169; Trans. Bot. Soc. Edinb. xiv. 158. *Monroa* Torr. *Munronia* Wight.

Murchison, Charles (1830–1879): b. Springfield, Vere, Jamaica, 1830; d. London, 1879. M.D., Edinburgh. LL.D., 1869. M.R.C.P. Lond., 1855. F.R.S. Lect. Bot. St. Mary's Hospital, 1856. In India, 1853–55. Trans. Bot. Soc. Edinb. xiv. 33.

Murphy, Edmund (fl. 1828–1844). Landscape Gardener. Of Dublin. 'Contributions to Fl. Hibernica,' Mag. Nat. Hist. 1828, 436. 'Agricultural Grasses,' 1844. Hortus siccus illustrating same. Pritz. 228; Jacks. 196; R. S. C. iv. 554.

Murray, Alexander (1798?–1838): b. 1798?; d. Aberdeen, 1838. M.D. Of Aberdeen. 'Connection of Rocks with Plants,' Mag. Nat. Hist. 1833, 335. 'Northern Flora,' 1836. Pritz. 228; R. S. C. iv. 554; N. B. G. 488; Mag. Nat. Hist. ii. (1838), 160.

Murray, Andrew (b. before 1810; d. 1850): d. Cambridge, 4th July, 1850. Curator, Cambridge Bot. Gard., 1845–50. 'Catalogue.' Sir Walter Scott, Journal, 1826. Gard. Chron. 1845, 291; 1850, 438.

Murray, Andrew (1812–1878): b. Edinburgh, 1812; d. Kensington, Jan. 1878. W.S. F.L.S., 1861. Pres. Bot. Soc. Edinburgh, 1858. Assistant-Secretary, Roy. Hort. Soc., 1860. 'Pines and Firs of Japan,' 1863. Lawson's 'Pinetum.' Pritz. 228; Jacks. 585; R. S. C. iv. 555; viii. 475; Trans. Bot. Soc. Edinb. xiii. 379; Gard. Chron. 1878, i. 86; Ent. Mo. Mag. xiv. 215; Journ. Bot. 1878, 63.

Murray, Lady Charlotte (d. 1808). Of Athol House, Scotland. 'The British Garden,' 1799; ed. 3, 1808. Eng. Bot. t. 404; Jacks. 407.

Murray, John (fl. 1815–1845). F.L.S., 1819. 'Physiology of Plants,' 1833. 'Economy of Vegetation,' 1838. Pritz. 229; Jacks. 585; R. S. C. iv. 557.

Murray, Patrick (fl. 1680). Baron of Livington. Pupil of Andrew Balfour. Collected 1000 plants at Livington before 1680, the nucleus of Edinb. Bot. Gard. Loudon, Encyc. Gardening, 281. *Livistona.*

Murray, Peter (fl. 1802–1840). Fossil plants in Edinb. New Phil. Journ. 1828, 31. R. S. C. iv. 559.

Murray, Stuart (fl. 1810–1819). 'Companion to Glasgow Bot. Garden.' Found *Avena pratensis* var. *alpina* in Arran. Eng. Bot. 2684; Pritz. 229; Jacks. 411.

Nasmyth, Sir James (fl. 1775). Of Posso. Discovered *Betula nana*. Eng. Bot. 2326; Loudon, 'Arboretum,' i. 94. *Nasmythia* Huds. = *Eriocaulon*.

Naylor, Frederick (1811?–1882): b. 1811?; d. Kew, 21st Dec. 1882. F.B.S.Ed. Collected British Plants. Papers in Trans. Bot. Soc. Edinb. viii. (1866); and Journ. Bot. 1871, 371; 1872, 236. Journ. Bot. 1883, 192; R. S. C. viii. 485.

Neal, Adam (fl. 1779). Catalogue of Garden of John Blackburn, 1779. Pritz. 230; Jacks. 415.

Neale, Adam (d. 1832): d. Dunkirk, 1832. M.D., Edinb., 1802. 'Ergot of Rye,' 1828. Pritz. 230; Jacks. 169.

Neck, Rev. Aaron (c. 1769–1852): b. St. Mary Church, Devon, c. 1769; d. 4th Oct. 1852. B.A., Oxon, 1791. Incumbent, Kingskerswell, Devon, 1832–1852. Discovered *Bupleurum aristatum* (see Herb. Mus. Brit.), 1801. Contributed to Eng. Bot. 1322, 2468.

Needham, Rev. John Turberville (1713–1781): b. London, 10th Sept. 1713; d. Brussels, 30th Dec. 1781. F.R.S., 1747. Prof. at Douay and (1744) Lisbon. Rector of the Brussels Academy, 1769. 'New Microscopical Discoveries,' 1745. Pritz. 232; Jacks. 585: Rose; Hœfer. *Needhamia* Br.

Neill, Patrick (1776–1851): b. Edinburgh, 1776; d. Canonmills, Edinburgh, 3rd Sept. 1851; bur. Warriston Cemetery, Edinburgh. LL.D., Edinb. A.L.S., 1807. F.L.S., 1813. F.R.S.Ed. First Vice-Pres. Bot. Soc., Ed., 1836. Printer. Correspondent of Cuvier. Article, 'Fuci,' in Edinb. Encyclop. Friend of George Don. Collected Scotch plants. Secretary, Wernerian Society. Gard. Chron. 1851, 567, 663; Cott. Gard. vii. 121; Greville, 'Algæ Brit.' iv.; Proc. Linn. Soc. ii. 191; Banksian Corresp. xii. (Mar. 12, 1801). *Neillia* D. Don.

Nelson, David (d. 1789): d. Timor, 20th July, 1789. Kew gardener. Assistant on Cook's 3rd voyage, 1776–1780. On H.M.S. 'Bounty,' 1787. Australian, Cape, and Timor plants in Herb. Mus. Brit. Fl. Tasmania, cxiii.; Gard. Chron. 1881, ii. 267; Brown, Prodr. 481. *Nelsonia* Br.

New, Rev. Charles (d. 1875). Methodist Missionary in Africa for many years. Collected on Kilima'Njaro, 1871. Journ. Bot. 1872, 235; 1875, 160; Journ. Linn. Soc. xiii. 141. Plants at Kew. *Helichrysum Newii* Oliv. & Hiern.

Newbould, Rev. William Williamson (1819–1886): b. Sheffield, 20th Jan. 1819; d. Kew, 16th April, 1886; bur. Fulham Cemetery. B.A., Cantab., 1842. M.A., Cantab., 1845. F.L.S., 1863. F.B.S.Ed., 1841. Orig. Member Ray Soc. Curate at Bluntisham, Hunts, 1845; at Comberton, Cambs., 1848. In Scotland, 1845; in Ireland, 1852, 1858; in N. Wales, with J. Gay and Babington, 1862. Intimate friend of C. C. Babington and H. C. Watson. MSS. in Bot. Dept., Brit. Mus. R. S. C. viii. 493; Top. Bot. 551; Journ. Bot., with portr., 1886, 161; Proc. Linn. Soc. 1885–86, 145. *Newbouldia* Seem.

Newman, Edward (1801–1876): b. Hampstead, 13th May, 1801; d. Peckham, Surrey, 12th June, 1876; bur. Nunhead. Printer and publisher, pteridologist and entomologist. F.L.S., 1833. Lived at Godalming, 1817–1826. Contributed to Mag. Nat. Hist. from 1831. In Ireland, 1839. 'History of Brit. Ferns,' 1840; ed. iv. 1865 (illustrated by himself). Edited 'Phytologist,' 1841–1854. 'Letters of Rusticus,' 1849. Pritz. 232; Jacks. 586; R. S. C. iv. 600; viii. 494; Memoir, with portr., 1876; Journ. Bot. 1876, 223; Gard. Chron. 1876, i. 823; Zoologist, 1876, pref., with portr.

Newton, James (1611?–1689?): b. 1611?; d. 1689? M.D. 'Enchiridion' (fragment), 1689. 'Herbal' (ed. by his son), 1752; ed. 6, 1802; begun, 1680. Friend of Ray, Hermann, and Commelin. "Stirpium Britannicarum explorator indefessus," Pluk. Alm. 200. Botanized in Scotland, Kent, Westmoreland, Dorset, Somerset, Cornwall, and Wales. Plants collected in Great Britain, Ireland, and Holland, Herb. Sloane, 205–207, 236–239. Phil. Trans. xx. 263; Pref. to Herbal; MS. notes in copy of Parkinson's 'Theatrum' in Bot. Dept., Brit. Mus.; Pritz. 232; Jacks. 586; Fl. Midd. 389. Portr. prefixed to Herbal.

Newton, John (fl. 1640). Surgeon. Of Colliton, Somerset. Brought plants from America to Parkinson (Theatrum, 596).

Newton, Rev. Thomas (d. 1607): b. Presbury, Cheshire; d. Little Ilford, Essex, May, 1607; bur. in Ilford Church. Surgeon, afterwards schoolmaster and clergyman. Rector of Little Ilford, 1583. Translated 'Herball to the Bible, 1587, from Lemnius. Pult. i. 108; Wood, Athen. Oxon., ed. Bliss, ii. 5; Cooper, Athen. Cantab.

Nichol, William (1836–1859): b. Edinburgh, March, 1836; d. Alexandria, 7th May, 1859. M.D., 1857. F.B.S.Ed. Muscologist: "added many mosses to the flora of Scotland." Trans. Bot. Soc. Edinb. vi. 290.

Nicholls, Robert (fl. 1745). Apothecary. Of London. Correspondent of Blackstone. Herbarium presented to Apothecaries' Company, 1745; plants now in Herb. Mus. Brit. Fl. Midd. 391; Sloane MS. 4054.

Nicholson, Henry (fl. 1712). M.D., Leyden, 1709. 'Methodus plantarum in hort. Dublin,' 1712. Pritz. 232; Jacks. 251.

Nicoll, William (fl. 1827–1834). Of Edinburgh. Invented section-cutting of fossil wood in 1827. 'Observations on recent and fossil Coniferæ,' Jameson's Edinb. Phil. Journ. 1834. Fossils in Brit. Mus. A. Geikie, 'Text-book of Geology,' ed. i. 94. *Nicolia* Ung.

Nid, John (d. c. 1659). Senior Fellow, Trin. Coll. Camb. Intimate friend of Ray, who preached his funeral sermon. Memorials of Ray, 11; Ray, Cat. pl. circ. Cantab. (pref.).

Nimmo, Joseph (fl. 1837–1846). Of Bombay. Investigated Flora of Bombay, and sent plants to Wight. Completed Graham's Cat. Bombay Plants (see preface). Journ. Bot. 1841, 300. *Nimmoia* Wight = *Ammania*, part.

Niven, James (1774?–1826): b. Pennicuik, Edinburgh, 1774?; d. same place, 9th Jan. 1826. Grandfather of the following. Gardener in Edinb. Bot. Gard., at Syon, 1796, to Hibbert, 1798. Collected in S. Africa for Hibbert, 1798–1803, and again for Lee and others, 1803–1812. Gard. Mag. ii. 255; Bot. Rep. t. 193; Trans. Linn. Soc. x. 46, 134; Lasègue, 447; Trans. Hort. Soc. i. 262. Plants in Herb. Mus. Brit. *Nivenia* Br. = *Paranomus* Salisb.

Niven, James Craig (1828–1881): b. Dublin, 1828; d. Hull, 16th Oct. 1881. Son of the following. Asst. Curator at Kew, 1852. Curator, Hull Bot. Gard., 1853. Lectured on Bot. at Hull. 'Cat. Herbaceous Plants at Kew,' 1853. Edited Maund's 'Bot. Garden,' 1878. Jacks. 412; Journ. Bot. 1881, 352; Gard. Chron. 1881, ii. p. 541, with portr. on p. 589; Life and portr., 'Garden,' xx. (1881).

Niven, Ninian (1799–1879): b. 1799; d. Dublin, 18th Feb. 1879. F.B.S. Ed., 1836. Curator, Glasnevin Bot. Gard., Dublin, 1834–1838. 'Companion to the Bot. Gard., Glasnevin,' 1838. Pritz. 233; Jacks. 411; Gard. Chron. (1879), xi. 277; R. S. C. iv. 627.

Nodder, Frederick Polydore (fl. 1777–1794). Botanic painter to Queen Caroline. Drew and engraved the plates of Martyn's 'Flora Rustica.' Drawings in Bot. Dept., Brit. Mus.

(To be continued.)

SHORT NOTE.

Wilts Plants.—The following are the additions to the Flora of Wilts, of which notice has been sent to me during the past year. Workers are few, so the list must be considered fair. Mr. E. J. Tatum at Salisbury, Rev. W. Moyle Rogers and Mr. W. A. Clarke at Chippenham, have been the chief workers. The *Rubi* and *Rosæ* are on the authority of Mr. Rogers. The numbers before the localities refer to the districts of Wilts :—*Thalictrum flavum* b. *riparium* Jord.; 10, Harnham, *Tatum*. *Cerastium tetrandrum* Curt.; 7, Old Castle, Salisbury, *Tatum*. *C. glomeratum* b. *apetalum* Dum.; 4, Savernake, *Rogers*. *Stellaria umbrosa* Opiz; 2, Ditches near 'The Old Horse and Jockey,' *Rogers*; *Trifolium striatum* b. *erectum* Lightf.; 10, Whaddon, *Tatum*. *Rubus mucronatus* Blox.; S. Dinton, *Tatum*. *R. calvatus* Blox.; 2, Near Langley Fitsurse, *Rogers & Clarke*. *R. pyramidalis* Kalt.; 5, Grinstead, *Tatum*. *R. carpinifolius* W. & N.; 5, Landford, *Tatum*. *R. sylvaticus* W. & N.; Landford, *Tatum*. *R. Bloxamii* Lees; 10, Downton, *Rogers & Tatum*. *R. anglosaxonicus* Gelert; 9, Compton, *Tatum*. *Rosa tomentosa* f. *sylvestris* Lindl.; 4, Near Marlborough (N. H. S. Report, 1888). *R. canina* var. *latebrosa* Déségl.; 4, Forest Hill, Marlborough, *F. A. Rogers*. *R. aspernata* Déségl.; 2, Bowood, *Clarke;* Box, *Rogers;* 3, Broad Hinton, *F. A. Rogers;* 4, Marlborough, *F. A. Rogers*. *Sedum Telephium* b. *Fabaria* Koch; 10, Alderbury, *Tatum*. *Epilobium parviflorum* var. *aprica;* 4, Savernake, *Marshall* (Journ. Bot. 1889, p. 143). *Leontodon hispidus* var. *hastilis;* 2, Near Corsham, *Rogers & Clarke*. *Sonchus arvensis* b. *glabra;* 2, Chippenham, *Clark*. *Erythræa pulchella* Fr.; 2, Near Corsham, *Rogers & Clarke* (only new for N. Wilts). *Polygonum Convolvulus* b. *pseudo-dumetorum* Wats.; 6, Winterbourne, *Tatum*. *Bromus madritensis* Linn.; 7, Specimen from "Sarum," in the Herb. Salisb., *Tatum*. *Aster Novi-Belgii* is naturalized at 10, Netherampton, *Tatum;* and Quidhampton, *Dartnell*. — T. A. Preston.

NOTICES OF BOOKS.

La Biologie Végétale. Par Paul Vuillemin. Pp. 378; 82 figs. Price 3*fr.* 50*c.* Paris: Baillière et fils.

There is no book in the English language with which this one may be compared as regards its scope and the treatment of its subject. The translation of Sachs' 'Lectures' gives us most of the information, and a great deal more after another fashion—so much more that in spite of its clearness, those "cultivated readers" to whom (with botanists) it is addressed are apt to find it a little unwieldy. It is not by any means intended to regard the 'Lectures' with other than grateful feelings, and the criticism is excited solely by the appearance of this interesting volume by M. Vuillemin, in which there is rendered an account of those phenomena of plant-life called biological, within small compass, at a small price, and in language which gains admirable directness and lucidity from a strict avoidance of those hard terms in which physiologists—especially German ones—wallow. It goes farther in making no very exhaustive demands on knowledge of other sciences to enable the reader to keep pace with the author. It shows us, in fact, that the life of plants, so far as it is understood, is essentially a simple affair; that what we know of it may be told, in outline at all events, in plain language, and with no recondite references. One can conceive that this is calculated to bring the study into contempt in some quarters, but no doubt that will be survived. That which is abstruse in the study, and difficult in the extreme, calling for the highest efforts of the human mind, is the prosecution of the inquiry and the winning of accurate results. The two things have been too long confounded. M. Vuillemin has happily recognised this, and he does not forget it. His book is a French one in more than one sense. There is a prominence in it of French methods of treatment, and probably this is as it should be—at the worst it is not so exclusively national in its treatment as many German books of the kind.

The introductory chapter is perhaps not equal to the remainder of the book in point of simplicity. The first chapter deals with the cell, and the second continues the subject. Chapter III. deals with the bodies of plants, the formation of tissues, and the combinations of these as exhibited in cellular and vascular plants. Chapter IV. is devoted to functions, and is introductory to what follows. The fifth chapter treats of fixation, support, and protection. Chapter VI. (misprinted IV.) is a long one, and it deals with absorption in perhaps somewhat too great detail, considering the balance of the book. The subject is tedious, and the author occasionally succumbs to it. Moreover, he takes absorption in a very comprehensive sense, and perhaps it would have been better to break up this chapter, and give its contents under several headings. Strangely enough, some of the most interesting and forcible passages in the book are embedded in this chapter. Excretion is used in a similarly comprehensive sense as the title of the next chapter—the giving off of gases and liquids, &c., being here dealt with alongside of much else. The eighth chapter is devoted to respiration, and the ninth has the inclusive title "transformations internes," and it keeps its promise! Chapter X. deals with the specially vital functions, while the last two (XI. and XII.) treat of the social life of plants, the former of the relations—social and sexual—between individuals of the same species, and the latter of the relations between different species, finishing with very interesting sections on parasitism and symbiosis.

There only remains the duty of mentioning that the book is well-printed and of handy form. The woodcuts are bad, so bad that they often fail to illustrate the author's meaning, and there is no index. The *table des matières* is a mere list of chapter headings. However, one would not thus ungraciously part with so excellent a book. The author has earned for it a high degree of success by his efforts to write attractively and accurately on a subject which often wears a forbidding aspect. G. M.

Science and Scientists; some papers on Natural History. By the Rev. JOHN GERARD, S.J. 8vo, pp. vii. 130. Catholic Truth Society, 21, Westminster Bridge Road, London. 1*s.*

THE papers forming this charming little volume are written by an enthusiastic lover of natural history studies, who, not satisfied with taking on trust the statements of book-writers, has gone into the fields, lanes, and woods, and patiently sought from Nature herself the information he desired. The evidence thus obtained, he very ably shows, is against rather than in favour of the theories of extreme evolutionists. The papers are pleasantly written, and give evidence not only of abundant knowledge of scientific literature, but also of close and attentive study of natural objects.

In the first paper, "Grant Allen's Botanical Fables," the various works of that versatile writer, such as 'The Evolutionist at Large,' 'Vignettes from Nature,' 'Flowers and their Pedigrees,' and 'Nature Studies,' are very ably criticized, and their weak points exposed in a pleasant and interesting manner. The second paper, "Who Painted the Flowers?," is devoted partly to a discussion of Mr. Grant Allen's 'Colours of Flowers,' but more especially to a criticism of Sir John Lubbock's interesting book, 'British Wild Flowers in their relation to Insects.' Sir John states that to bees "we owe the beauty of our gardens, the sweetness of our fields. To them flowers are indebted for their scent and colour; nay, for their very existence, in its present form." This extreme statement Mr. Gerard ably combats, bringing from Nature a number of examples which disprove it. Whilst acknowledging that plants are benefited by the visits of insects, he denies that they are the sole cause of the beauty and perfume of our wayside weeds.

In concluding this thoughtful essay, he says:—"Briefly to recapitulate. It is maintained on the one hand that all the beauty of flowers can be explained on Darwinian principles, as being of advantage to them in the struggle for existence by attracting the visits of honey-seeking insects, which assist the process of fertilization. It appears on the other hand, however, that there are many difficulties in the way of such a theory to be found by ordinary observation in the fields around us. The problem of beauty of form remains untouched by such an explanation. There are conspicuous and highly-coloured flowers which contain no honey, and others which produce no seed; whilst some of the least noticeable of blossoms are richest in honey, and the greatest favourites of bees. Some of the most successful tribes of plants do without insect-agency, and prosper better than those which employ it most, and some which largely employ it, never being fertilized, obtain no benefit in return. Plants of the same genus may differ absolutely in their attitude as to insects, and yet their development be so little affected that they bear their affinity to one another stamped upon every feature, and no diversity of insect-workers can alter any one minutest character in individuals of one species. In view of all this, is it scientific to flatter ourselves that we have probed the whole mystery to the bottom, and to lay down that to insects alone do we owe the beauty of our gardens, and the sweetness of our fields?" (p. 43).

The next paper, "Some Wayside Problems," treats of climbing plants, the sleep of plants, and other phenomena of plant-life. This is followed by three papers bearing more especially on zoological subjects. Mr. Gerard is to be congratulated on having produced a book pleasantly written, free from dogmatism, well sustained and full of interest, and one that will be read with pleasure and approval not only by those students of Nature who, whilst they accept with gratitude much of the teaching of modern times, naturally shrink from the extreme views of some of the more recent exponents of Darwinism, but also by all who like to hear both sides of a question. The book is well printed and neatly bound, and should command a large sale. J. E. Bagnall.

Atlas deutscher Meeresalgen. By Dr. J. Reinke. Erstes Heft. fol., pp. 34; 25 plates. Paul Parey, Berlin. 1889.

This fine work, of which the first number is before us, is published by the Commission appointed by the Prussian government for the scientific investigation of the German seas, in the interests of the fisheries. The practical importance of the marine flora as the direct or indirect source of the food of all fishes is dwelt upon in the preface, and is indeed sufficiently obvious. It is a matter for congratulation that the algological investigations have been entrusted to the able hands of Dr. Reinke, who is evidently carrying them out with complete efficiency.

In this Atlas it is proposed to publish figures and descriptions of all such German sea-weeds as have not been satisfactorily figured before. The standard of the publication is extremely high in the matter of illustration, for the works of Bornet and Thuret are cited in the preface as the model of what algological figures ought to be. In the 25 plates contained in part 1, this high standard is worthily maintained. The draughtsmen are Dr. F. Schütt and Herr. P. Kuckuck, both of whom are Algologists as well as artists. It is proposed to publish 100 plates altogether, but the continuation of the work is dependent on the reception which it meets with at the hands of botanists. We cannot doubt that their verdict will be a very favourable one. The descriptions and plates are not at present arranged in any systematic order, though Phæophyceæ, Rhodophyceæ, and Chlorophyceæ are kept distinct. Of course a systematic re-arrangement can easily be made when the work is complete.

In order to understand the Atlas, and especially to learn the systematic position assigned by the author to his numerous new genera, it is essential to refer to another work of Dr. Reinke's, published by the same Commission, his 'Algenflora der westlichen Ostsee deutschen Antheils.' Here the more general questions of Algology are discussed, and a fuller account given of those forms of which the atlas only supplies the generic and specific diagnosis.

In this first part 30 species or varieties are figured and described, 24 of which belong to the Phæophyceæ, a sub-class on which Dr. Reinke is known to be a special authority. As a rule every species is illustrated by a life-size drawing, and by a series of microscopic figures, under various powers, showing every part of the structure, and, so far as is possible, all stages of development. The figures are remarkable for their minute accuracy, and it will be noticed that special attention is paid to the form and distribution of the chromatophores. An English botanist on looking at these plates may well feel envious, and wish that our own far richer algal flora could be illustrated in the same thoroughly scientific manner. Let us trust that this wish will eventually bring about its own realization.

We will notice a few of the more important forms specially. *Halothrix* is a new genus founded by Dr. Reinke, for the species *H. lumbricalis* (pl. 1), placed by Kützing in *Ectocarpus*, and transferred by Hauck to *Elachista*. The genus comes very near *Giraudia*, but the upright assimilating filaments are usually monosiphonous. Only plurilocular sporangia are known, which are developed in sori on the upper parts of these filaments. The central portion of the mother-cell of each sorus divides up to a certain extent, but remains sterile.

The next genus, *Symphoricoccus*, is founded on a species *S. radians*, discovered by Dr. Reinke. It is closely related to *Elachista*, but differs from that genus in the fact that the unilocular sporangia (here the only kind known) occur on the upper part, as well as at the base of the assimilating filaments. It is interesting to note that here a small cell is cut off at the base of each sporangium; this cell grows out into the cavity of the old sporangium when it is empty, forming a new one to replace it. Much the same process has long been known to occur in *Cladostephus*.

Kjellmannia Rke. is an interesting genus placed by its author in the group Punctarieæ. The branched polysiphonous thallus bears short monosiphonous branches. There are two kinds of sporangia, *both plurilocular*, one kind intercalary, the other in sori. Like its near relations this genus has no definite growing point, the intercalary growth going on indiscriminately in all regions.

Passing over some forms of *Asperococcus* and *Ralfsia*, of less general interest, we come to *Microspongium gelatinosum* Rke. (Pls. 7 and 8.) This is the type of a new genus of Myrionemeæ, coming next to *Ascocyclus* Magn. There is a basal disc, two cells thick, with marginal growth. From this arise vertical hairs and assimilating filaments. The latter have a chiefly *apical* growth, a fact which shows how little importance can be attached to this character among the Phæosporeæ. Plurilocular and unilocular sporangia are formed on distinct plants, but it is not absolutely certain that these forms are specifically identical.

In plates 9 and 10, three varieties of *Leptonema fasciculatum* Rke. are figured. *Leptonema* is a new Elachisteous genus, placed next *Halothrix*. From a creeping protonema arise assimilating filaments only branched at the base. Growth is intercalary and basipetal as in the group generally. Both kinds of sporangia occur. The unilocular sporangia arise laterally, close to the base of the vertical filaments, while the plurilocular are formed higher up on the same filaments, by the transverse elongation and septation of certain of their cells.

Three plates are devoted to *Desmotrichum* Kütz. One species, *D. scopulorum*, is new.

The specific value of the form *Scytosiphon pygmæus* Rke. (plate 14), seems to be doubtful.

Ascocyclus Magn. is a genus connecting *Ectocarpus* with *Myrionema*, and its species have hitherto been placed in one or other of the latter genera. This genus, though founded so long ago as 1874, is not given among the synonyms in Hauck. Five species are here described and figured, of which two are new.

Of *Ectocarpus*, four species are given, one of which, *E. repens* Rke., is new, and connects this genus with *Ascocyclus*. It should be mentioned that Dr. Reinke defines *Ectocarpus*, so as to include both *Streblonema* Derb. et Sol., and *Pilayella*, Bory.

As regards the Phæosporeæ generally, the author after separating the Cutleriaceæ, Tilopterideæ, and Laminariaceæ, unites all the rest into a single family the Ectocarpaceæ, which group themselves about the genus *Ectocarpus*. He has found it impossible to break up this great family without resorting to minute and artificial divisions. The Ectocarpaceæ are, it is true, arranged in groups for convenience, but these groups merge into one another. On page 37 of the 'Algenflora' a scheme of the relationships of the various Ectocarpaceous genera is given.

Of the Florideæ only two are figured in this part. *Rhodochorton chantransioides* Rke. is a new species, remarkable for its very long, spiral chromatophores. A Baltic form of *Antithamnion boreale*, Gobi, is also included.

There are one or two points of interest among the few Chlorophyceæ given. *Blastophysa rhizopus* Rke. is a very curious plant, bearing a certain general resemblance to some stages of *Botrydium*, but not known for certain to form zoospores. Its reproduction, so far as is known, is by vegetative division simply.

Cladophora pygmæa Rke. is a new, and apparently insignificant species of that enormous genus.

Epicladia Flustræ Rke. is the type of a new confervaceous genus, possibly not distinct from *Entocladia*, already established by the author. It consists of much branched filaments, adherent to the surface of the Flustra, and cohering to form a pseudoparenchymatous disc. The reproduction is by zoospores formed in abundance in each cell. It will be remembered that *Entocladia* Rke. grows in the thickness of the cell-wall of various Algæ.

Pringsheimia scutata Rke. represents a new genus, doubtfully referred to the Ulvaceæ, with which it seems to have very little in common. In habit it resembles a Coleochæte, but has no bristles. It is epiphytic on various Algæ and has a marginal growth, its cells branching, and then dividing. Reproduction is of two kinds. 1. Asexual. Here a few biciliate macrozoospores are formed in each of the more central cells of the thallus. They escape by a crevice in the cell-wall. 2. Sexual. Here a larger number of motile cells, also biciliate, are formed, which escape by solution of the cell-wall. They swim towards the light, and conjugate in pairs. The germination of the zygospore is unknown, and it is not absolutely proved that the sexual and asexual forms belong to the same plant. It seems very likely, as Dr. Reinke suggests, that this curious plant is really co-generic with the *Chætopeltis* described by Möbius in the Berichte d. deutschen bot. Gesellschaft, 1888, p. 242.

We shall look forward with great interest to the continuation of this beautiful work, which does equal credit to the author, the artists, and the enlightened government department which is presiding over its publication. D. H. Scott.

Articles in Journals.

Bot. Centralblatt. (Nos. 1–4).—J. Freyn, 'Zur Kenntniss einiger Arten der Gattung *Ranunculus*.'

Bot. Gazette (Nov. 29). — R. Thaxter, 'A New American *Phytopthora*' (*P. Phaseoli*, sp. n.). — J. M. Coulter & J. N. Rose, 'N. American Umbelliferæ' (*Tæniopleurum*, gen. nov. = *Carum Howellii*). —F. D. Kelsey, 'Montana *Erysipheæ*.' — (Dec. 26). C. Robertson, 'Flowers and Insects.' — H. A. Evans, 'Relation of Flora to Geological Formations in Lincoln County, Kentucky.'

Bot. Zeitung (Nos. 1–4). — E. Zacharias, 'Ueber die Zellen der Cyanophyceen' (1 plate).

Gardeners' Chronicle (Jan. 4).—*Aerides Augustianum* Rolfe, n. sp. —(Jan. 11). G. Henslow, 'Hybrid Rhododendrons.' — (Jan. 18). W. B. Hemsley, *Solanum macranthum* (fig. 13).—(Jan. 25). 'The Weather Plant' (*Abrus precatorius*).

Journ. Linn. Soc. (xxv. 172: Jan. 28).— J. G. Baker, 'Further Contributions to Flora of Madagascar' (*Anisopoda* (Umbelliferæ Ammineæ) *Brachyachenium* (Compositæ Mutisieæ), genn. novv.: 2 plates).—W. B. Hemsley, 'Report on collections from Christmas Island, Indian Ocean' (*Hoya Aldrichii* Hemsl., *Dicliptera Maclearii* Hemsl., *Phreatia Listeri* Rolfe, *Asplenium centrifugale* Baker, *Acrostichum Listeri* Baker, spp. nn.) — S. le M. Moore, '*Apiocystis* a Volvocinea' (2 plates).—D. Morris, '*Erythroxylon Coca*.'—P. MacOwan, 'New Cape Plants.' — J. C. Costerus, 'Malformations in *Fuchsia globosa*' (4 plates).—A. Lister, 'Ingestion of Food-material by Swarm-cells of Mycetozoa.'

Notarisia (Oct. 1889). — J. Deby, 'Bibliographie récente des Diatomées.'—D. Levi-Morenos, 'Eleudii di Diatomee rinvenute nel tubo digerente d'animali acquatici.'

Nuovo Giornale Bot. Ital. (Jan. 7). — C. Massalongo, 'Note teratologische.' — A. Goiran, 'Notizie Veronesi di botanica archeologica.' — Id., 'Sopra *Acalypha virginica* considerata in ordine alla diffusione nel Veronese.'—L. Macchiati, *Lyngbya Borziana*, sp. n.— Id., 'Sulle sostanze coloranti dalle gemma foglifere del *Aesculus Hippocastanum*.'—G. Passerini, 'Sopra alcune *Phoma*.'— A. Jatta, 'Licheni Patagonici.'—G. Arcangeli, 'Sui pronubi del *Dracunculus* *vulgaris.*'—Id., 'Sull' allungamento dei piccioli nella foglie di *Euryale ferox.*'—P. Baccarini, 'Note patologiche.'—G. Cicioni, 'Sopra alcune specie trovate in quest' anno nell' Umbria.'—Id., 'Sopra una monstrosità del *Polygonum dumetorum.*' — D. Levi-Morenos, 'Sulla distribuzione peristomatica dell' autocianina in alcuni *Sedum.*' — G. Cuboni, 'Anomalie fiorali del *Colchicum.*' — A. Bertoloni, 'Sull' origine dello studio dei semplici in Italia.' — U. Martelli, 'Sull' *Arum pictum* e suoi pronubi.' — L. Micheletti, 'Sulla *Rudbeckia* che cresce lungo l'Olona.' — R. Pirolta, 'Sulla presenza in Lombardia della *Commelina communis.*' — P. Baccarini, 'Sullo sviluppo dei picnidii.'

Oesterr. Bot. Zeitschrift (Jan.).—A. Kerner, 'Die Bedeutung der Dichogamie.'—J. Freyn, 'Plantæ Karoanæ.'—A. v. Degen, *Asperula Hercegovina* & *A. pilosa*, spp. nn.—J. A. Baumler, 'Mycologische Notizen.'

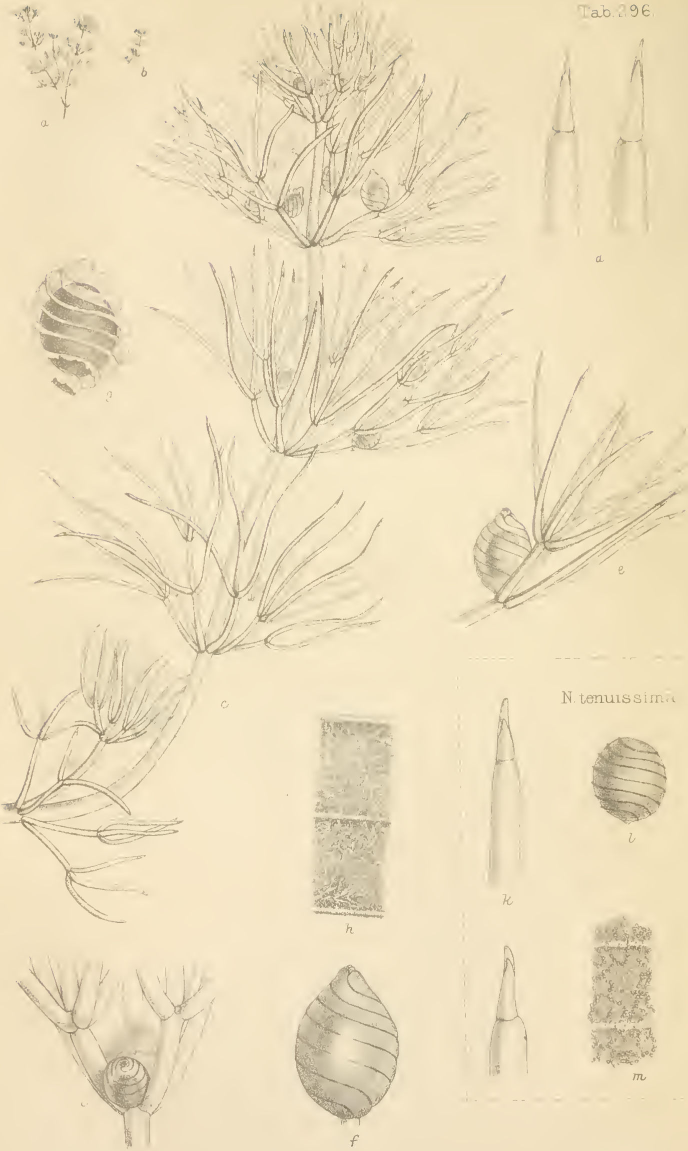
Scottish Naturalist (Jan.)—Mrs. Farquharson, 'Ferns and Mosses of Alford District.' — J. Roy, *Sciadium Arbuscula* in Britain. — Id., 'Desmids of Alford District.' — W. Wilson, 'Growth of *Phalaris arundinacea.*' — W. H. Beeby, 'On the Flora of Shetland.' — J. Stirton, Scottish species of *Grimmia* (*G. Horni*, *G. platyphylla*, spp. nn.).—J. W. H. Trail & W. Phillips, 'Scottish Discomycetes.' —J. W. H. Trail, 'Fungi records for Clyde.'

LINNEAN SOCIETY OF LONDON.

December 19, 1889. — Mr. J. G. Baker, F.R.S., Vice-President, in the chair. — Messrs. S. A. Moore and J. J. Walker, R.N., were admitted, and Messrs. C. Curtis and P. Groom were elected Fellows of the Society. — A paper was read by Mr. T. Johnson on *Dictyopteris*, in which he gave an elaborate account of the life-history of this brown sea-weed, with remarks on the systematic position of the *Dictyotaceæ.* Dr. Scott, Mr. George Murray, and Mr. A. W. Bennett criticized various portions of the paper, and acknowledged the important scientific bearing of the facts which had been brought out by Mr. Johnson's careful and minute researches.

January 16, 1890.—Mr. J. G. Baker, F.R.S., Vice-President, in the chair. — Mr. S. Lithgow was elected, and the following were admitted Fellows of the Society: Messrs. C. W. Turner, J. T. Tristram Valentine, William Rome, and Major A. R. Dorward.— Mr. Clement Reid exhibited and made some remarks upon a collection of fruit of *Trapa natans* from the Cromer Forest Bed at Mundesley. — Mr. J. G. Baker exhibited and described a collection of cryptogamic plants from New Guinea, upon which Mr. A. W. Bennett and Capt. Elwes made some critical remarks. — In the absence of the author, Mr. A. Barclay, a paper was read by Mr. B. D. Jackson, "On the Life-history of a remarkable Uredine on *Jasminum grandiflorum.*" A discussion followed, in which Mr. A. W. Bennett and Prof. Marshall Ward took part.

Tab. 296.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Nitella Nordstedtiana, *Groves*.

NOTES ON THE BRITISH *CHARACEÆ* FOR 1887-9.

By Henry and James Groves.

(Plate 296.)

Of the three years which have elapsed since the publication of our last instalment of 'Notes,' 1887 and 1888 were comparatively unproductive of additions to our knowledge of the British Chara Flora. During 1889, on the other hand, one new species has been added to our list, and we have received specimens representing important extensions of the known distribution of several of the rarer species.

In our 'Notes' for 1883 we gave a list of the 48 Watsonian counties from which we had not seen specimens of any of the species. This list is now reduced to 22, *viz.*:—Gloster E., Monmouth, Denbigh, Flint, Ayr, Linlithgow, Aberdeen N., Banff, Cantire, Ebudes M. & S., Cork S., Tipperary N., Kilkenny, Carlow, Queen's Co., Wexford, Kildare, King's Co., Longford, Monaghan and Tyrone. The most neglected districts at the present time are:—1. That around the Bristol Channel and almost the whole of Wales, Carnarvon and Anglesea being excepted. 2. A band across the south of Scotland from Ayr to Berwick. 3. North Aberdeen and Banff. 4. The Islands from Mull to Cantire. 5. A large tract of the interior of Ireland reaching almost from the north to the south.

Through the kindness of Mr. F. J. Hanbury, we have been enabled to examine the specimens of British Charas in the herbarium of the late Dr. Boswell, the most interesting result being the finding of a specimen of *Nitella mucronata* from Hants N. We take this opportunity of thanking our correspondents for the specimens they have sent us.

Chara fragilis, *Desv.* — Devon N., 1864, *W. P. Hiern, herb. Boswell;* Worcester, 1889, *R. F. Towndrow;* Brecon, 1885, *J. Fraser*, comm. *A. Bennett;* Carnarvon, 1885, *J. E. Griffith*, comm. *A. Bennett;* Haddington, 1867, *J. B. Syme, herb. Boswell;* Ebudes N., 1883, *H. N. Dixon*, comm. *J. Saunders;* Ross E., 1889, *H. T. Mennell*, comm. *A. Bennett;* Hebrides (S. Uist), 1888, *A. Somerville*, comm. *A. Bennett;* Down, 1887, *S. A. Stewart.*

var. *barbata.* — Kirkcudbright, *J. McAndrew;* Ross E., 1889, *H. T. Mennell*, comm. *A. Bennett;* Orkney, 1888, *J. W. H. Trail*, comm. *A. Bennett;* Channel I. (Guernsey), 1889, *E. D. Marquand.*

var. *capillacea.* — Stirling, 1884, *R. Kidston;* Kerry S., 1887, *R. Scully.*

var. *Hedwigii.* — Norfolk E., 1885, *E. F. & W. R. Linton;* Northampton, 1889, *H. N. Dixon*, comm. *J. Saunders.*

var. *delicatula.*—Perth W., 1888, *R. Kidston.*

C. connivens, *Braun.* — Norfolk E., Heigham Sound, 1889, *J. Bidgood.* An important extension of the British distribution of this species, which had hitherto only been collected in Devon S. and Hants S.

C. ASPERA, *Willd.*—Suffolk E., Kessingland, 1886, *W. M. Hind*, comm. *A. Bennett;* Perth W., Lake of Monteith, 1884, *R. Kidston;* Hebrides, South Uist, 1888, *A. Somerville*, comm. *A. Bennett;* Kerry S., Killarney, 1887, *R. Scully;* Channel I., Guernsey, 1889, *E. D. Marquand.*

var. *capillata.*—Dublin, near Blanchardstown, 1889, *R. Scully.*

var. *subinermis.*—A more legibly labelled specimen in the Boswell herbarium has enabled us to identify the locality given in our 'Review' as "Hut Pond, Hants," with Fleet Pond, N. Hants.

C. POLYACANTHA, *Braun.* — Wigton, I. of Whithorn, 1889, *J. McAndrew*, comm. *A. Bennett.*

C. BALTICA, *Bruzel.* — We have received from Mr. Marquand a specimen collected at Grande Mare, Guernsey, in 1889, which appears to be best placed here, but is not altogether satisfactory.

C. CONTRARIA, *Kuetz.* — Fife, Kinghorn Loch, 1873, *J. B. Syme, herb. Boswell;* Kerry S., Caragh, 1888, *R. W. Scully.*

var. *hispidula.* — Berks, Wytham, 1887, *G. C. Druce;* Fife, L. Gilly, 1868, *J. B. Syme, herb. Boswell.*

C. HISPIDA, *L.* — Cornwall W., 1885, *O. Nordstedt;* Dorset, 1872, *S. M. Payne, herb. Boswell:* Cumberland, *E. Hodgson, herb. A. Bennett;* Hebrides (S. Uist), 1888, *A. Somerville*, comm. *A. Bennett;* Kerry S., 1888, *R. Scully.*

var. *rudis.*—Haddington, Guillen Ponds, 1850, *J. B. Syme, herb. Boswell;* Dublin, near Lucan, 1889, *R. W. Scully;* Down, Loughinisland, 1887, *S. A. Stewart.*

C. VULGARIS, *L.* — Devon, S., 1888, *H. G.;* Wilts S., 1889, *E. J. Tatum;* Worcester, 1889, *R. F. Towndrow;* Cheviotland (Holy I.), 1889, *H. Masterman;* Kirkcudbright, *J. McAndrew;* Perth W. (Clackmannan), 1838, *herb. Boswell;* Hebrides (Harris), 1889, *W. S. Duncan*, comm. *A. Bennett;* Kerry S. 1888, *R. Scully;* Down, 1887, *S. A. Stewart.*

var. *longibracteata.*—Berks, 1887, *G. C. Druce;* Lancs. N., 1874, *E. F. Linton, herb. Boswell;* Orkney, 1875, *J. T. Boswell, herb. Boswell;* Kerry N., 1888, *R. W. Scully.*

var. *papillata.* — Sussex W., 1873, *J. L. Warren, herb. Boswell;* Kerry S., 1889, *R. W. Scully.*

LAMPROTHAMNUS ALOPECUROIDES, *Braun.* — Dorset, The Fleet, near Langton Herring, 1887, *W. Bowles Barrett.* An interesting discovery, especially now that the plant seems to have disappeared from the only other British station, Newtown, I. of Wight.

TOLYPELLA GLOMERATA, *Leonh.* — Herts, Old Wellbury, 1888, *J. Saunders.*

T. PROLIFERA, *Leonh.*—Northampton, Rockingham, 1887, *T. B. Blow.*

Nitella Nordstedtiana, nobis.

Chara batrachosperma, Reich. Flor. Germ. Exc. (1830-3), p. 148; Icon. Bot. (1830), p. 36, t. 794 (ex parte), (non Weiss).

C. tenuissima, Reich. Icon. Bot. t. 791, (ex parte) (non Desv.).

C. glomerata, Reich. Moessl. Handb. (1834), p. 1663 ?

C. tenuissima var. *batrachosperma*, Rabenh., Fl. Lusat. ii. p. 166 (*fide* Braun).

C. tenuissima vars. *batrachosperma* & *ramulosa*, Gant. Oesterr. Char. (1847), p. 10.

N. tenuissima var. *batrachosperma*, Kuetz. Phyc. Germ. (1845), p. 256; Rab. Deutsch. Krypt. Flor. (1847), p. 196.

N. batrachosperma, Braun, Schweiz. Char. (1847), p. 10, nomen (non Agardh); Consp. Char. Europ. p. 2; Krypt. Flor. Schles. p. 400; Fragmente Monog. Char. p. 66 t. 5, f. 131-2; Kuetz. Sp. Alg. (1849), p. 515; Tab. Phyc. vii. (1857), t. 35, f. 1; Nordst. Skand. Char. in Bot. Not. 1863, p. 36; Wahlst. Sver. & Norg. Char. (1875), p. 20; Sydow, Europ. Char. (1882), p. 30; Migula in Rab. Krypt. Flor. Deutsch. sect. 5 (1890), p. 184, f. 52-4.

Exsiccata:—Areschoug, 150. Braun, R. & S. 78. Fries, Hb. Norm. xvi. 100. Nordst. & Wahlst. 42. Rab. Alg. Sachs., 220* (*fide* Nordst.).

Plant usually minute. Stem about ·15-·2 mm. thick. Internodes from once to twice the length of the branchlets. Branchlets usually 8 in a whorl, mostly twice divided, sometimes in the sterile whorls only once divided, and rarely in the fertile whorls one of the tertiary rays again divided. Rays of the first forking 4-5; 2-3 again divided into 3-5 rays, the remainder usually simple. Tertiary rays usually about half the total length of the branchlets, 2-celled, the ultimate cell ·053-·11 mm. long, ·018-·025 mm. thick at the base, tapering to a sharp point. Fruit solitary, usually at the first and rarely at the second forkings broadly ovoid, about ·43 mm. long, ·29 mm. thick, coronula small. Oospore ·23-·25 mm. long, ·21-·22 mm. thick, slightly flattened when ripe, showing 7 striæ, side walls of the enveloping-cells becoming thickened, and remaining, when the outer wall has decayed, standing out as wing-like ridges on the oospore. Antheridia at the same nodes as the fruit. Monœcious.

N. Nordstedtiana is one of the smallest species of the genus. It is allied to *N. tenuissima*, from which it may be distinguished by its oospore having prominent wing-like ridges, and irregularly minutely warty surface, which is shrivelled in appearance; by its fruiting at the first forking of the branchlets, which is very exceptional in *N. tenuissima;* by the less rigid habit; by the more sharply-pointed end-cells of the branchlets; and usually by the proportionately shorter internodes.

The distribution of the species as recorded by Braun & Nordstedt is:—Finland, Sweden, Germany, France, Spain and Italy, also North America (Massachusetts), and Australia. It was discovered in Britain by Mr. W. S. Duncan, in July, 1888, in a loch near Obbe, in the Isle of Harris, Outer Hebrides, and was forwarded to us by Mr. Arthur Bennett. The British plant is a small form from 1-2 inches high. Dr. Migula, in the recently-published edition of Rabenhorst's Krypt. Flor. Deutsch., describes four forms under the name of *N. batrachosperma*:—*Forma typica*, 4–6 cm. high, the plant from near Berlin with very dense whorls, the upper being closely aggregated; *f. maxima*, a plant from Mannheim, 15 cm. high, which is described as resembling a large lax form of *N. tenuissima*; *f. fallax*, 8 cm. high, a lax plant almost resembling *N. gracilis*;* *f. minor*, from Baden, which is much like our form and that from Sweden. The species is placed by Braun among the "*Glœocarpæ*," but in our form the presence of any gelatinous covering to the fruit is sometimes very doubtful. Dr. Nordstedt, when identifying our plant with the Scandinavian *N. batrachosperma*, suggests a doubt as to the correctness of regarding the species as one of the "*Glœocarpæ*."

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* The specimen in the British Museum is too bad to admit of identification without soaking out, so we have followed Nordstedt in quoting it.

The name *N. batrachosperma* is generally adopted for this species, but it is quite untenable. *Nitella batrachosperma* was described by Agardh in 1824 (Syst. Alg. p. 126) when he founded the genus, quoting the synonym "*C. batrachosperma*, Dec., Thuill." Thuillier's plant has since been identified by Braun as a form of his *Chara fœtida* (*C. vulgaris*), and, whatever plant Agardh had in view, there is no doubt that it was not the present species. The name *Chara batrachosperma* was first used by Weiss for *Batrachospermum moniliforme*. Braun's action in starting a new *N. batrachosperma* upon the foundation of Reichenbach's confused ideas, instead of giving an entirely new name, is incomprehensible, considering the slight grounds upon which he re-christened so many species. In the absence of any valid name for the species, we are reluctantly compelled, in accordance with the "Laws," to give it a name, and we think we cannot do better than dedicate it to the greatest living authority on the genus.

We are indebted to our friend Mr. J. Guardia for photomicrographs of the surfaces of the two oospores which are copied on our plate. The importance of the markings on the surface of the oospore as a specific character has been well shown by Dr. Nordstedt in his recent valuable paper on the subject.

N. GRACILIS, *Ag.* — Kerry S., Caragh Lake, 1889, *R. W. Scully*. It is very gratifying to have this record, as we understand that some uncertainty attaches to the locality from which we had previously recorded this as an Irish plant.

N. MUCRONATA, *Kuetz.* — Hants N., Fleet Pond, 1873, *J. L. Warren, herb. Boswell.* This station is in the intermediate drainage system (the Thames) between the original station in the Channel drainage and the more recently discovered locality in the Ouse at Bedford.

N. TRANSLUCENS, *Ag.* — Middlesex, Ruislip, *J. Benbow*; Berks., Burghfield, 1887, *G. C. Druce*; Hebrides, Harris, 1889, *Mrs. Duncan*, comm. *A. Bennett*; Kerry N., L. Nogeeha, 1889, *R. W. Scully*; Down, Derry L., 1887, *R. L. Praeger*, comm. *S. A. Stewart.*

N. FLEXILIS, *Ag.*—Perth W., L. of Monteith, 1884, *R. Kidston*;

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* We have not seen specimens of these larger forms.— H. & J. G.

Westerness, Port Appin, 1885, *C. Bailey;* Dumbarton, Kilpatrick Hills, 1889, *L. Watt*, comm. *A. Bennett;* Kerry S., Caragh Lake, 1889, *R. W. Scully.*

var. *crassa.* — Westmoreland, Grasmere, 1884, *T. A. Cotton*, comm. *A. Bennett.*

N. OPACA *Ag.*— Kent W., 1888, *J. G.;* Renfrew, 1887, *R. Kidston;* Selkirk, 1876, *A. Craig Christie, herb. Boswell;* Haddington, 1861, *J. T. Boswell, herb. Boswell;* Kincardine, 1860, *J. B. Syme, herb. Boswell.*

EXPLANATION OF PLATE 296.—A, *Nitella Nordstedtiana*, nobis; plant natural size, from specimen in Dr. Ward's herbarium. B, Branch, from specimen sent to us fresh by Mr. A. Bennett. C, Ditto, × 19. D, End-segments of fertile branchlets, × 150. E, Fruiting branchlet, × 32. F, Fruit, × 60. G, Oospore, × 60. H, Part of surface of oospore, × 375 (after photo. by J. Guardia). I, Forking, with antheridium and young fruit, × 60. K, *N. tenuissima*, Kuetz.; end-segments of fertile branchlets, × 150. L, Ditto, oospore, × 60. M, Ditto, part of surface of oospore, × 375 (after photo. by J. Guardia).

A MONOGRAPH OF THE GENUS *PODAXIS* DESV. (= *PODAXON* FR.).

By GEORGE MASSEE.

(Concluded from p. 39.)

AFFINITIES.

From what has already been said, it will be seen that we are dealing with a genus showing considerable latitude in the mode of spore-formation, in the most typical species the spores are produced as asci of peculiar form and mode of arrangement, and in searching for homologous structures we find the nearest approach in the subterranean fungi constituting the *Hypogæi*, which are divided into three groups, the *Hymenogastreæ*, or basidiosporous division; the *Tuberaceæ*, characterized by having the spores produced in asci; and the *Elaphomycetæ*, also ascigerous, but so evidently distinct in many important points from the *Tuberaceæ* that Tulasne considered the division of ordinal value, and expressed his views as to its relative position as follows:—"Elaphomycetes Tuberaceis genuinis quoad fructificationem analogi, structura morphosisque floccoso-pulveracea sicca ab eis toto coelo differunt et ad Lycoperdeos basidiosporos accedunt, qua propter fungus utriusque familiæ medii connectere videntur."*

The *Elaphomycetæ*, as already stated, are truly ascigerous, by which I mean that one or more spores produced by free cell-formation appear in a mother-cell, from which they eventually escape, the wall of the mother-cell forming no part of the walls of the daughter-cells, but remaining usually for some time in a shrivelled condition after the escape of the daughter-cells, and known as an ascus; hence the resemblance presented by the *Elaphomycetæ* to the *Lycoperdineæ*, as stated by Tulasne, depends on the spores forming a pulverulent mass when mature, and on the presence of a capillitium, imperfect at first, as would naturally be expected, nevertheless the precursor of a contrivance which, in its perfected form, as seen in the majority of *Gastromycetes* that become elevated into the air when mature, proved of service in spore-dissemination, so long as this was effected by physical means, but which we find to be eventually superseded in the *Phalloideæ*, where, by a gradual modification of certain portions of hyphæ along other lines, we find a series of contrivances in the form of scent, colour, and sugar respectively produced for the purpose of favouring the visits of insects, and thus securing spore-dissemination after the fashion of seed-dispersion in certain groups of phanerogams. I have shown elsewhere* the gradual conversion of the ascigerous *Tuberaceæ* into the basidiosporous *Hymenogastreæ*, due to the changes of asci into basidia, and the subsequent evolution of the whole of the above-ground *Gastromycetes* from the subterranean ascigerous *Tuberaceæ* through the *Hymenogastreæ;* and now we find a second attempt on the part of the *Tuberaceæ* to evolve an above-ground branch through the *Elaphomycetæ*, and continued by the genera *Podaxis*, *Tulostoma*, and possibly *Batarrea* and *Queletia*.

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* 'Fungi Hypogæi,' p. 101.

The asci in the *Elaphomycetæ* appear to be in a very unstable state; in *Elaphomyces granulatus* Vitt. we find asci of the same shape, and arranged in clusters exactly as in *Podaxis* (fig. 15); and in one and the same portion under the microscope, asci containing one, two, three, and four spores respectively can usually be seen, the asci varying in form and size depending on the number of contained spores (figs. 16–18); in the remaining species of *Elaphomyceæ* the asci, as regards arrangement and variability, agree with *E. granulatus*. In all the species of *Elaphomyces* the commonest number of spores in an ascus is four, but a single spore is by no means uncommon; and the capillitium, although consisting of thick-walled and obviously differentiated hyphæ, is devoid of any arrangement in the way of spiral corrugations for promoting elasticity, which would be useless in a subterranean fungus; but in *Podaxis*, where, due to the excessive development of the homologue of the sterile basal portion in many of the *Hypogæi*, the peridium is elevated above ground, we find an improvement in the portion specially told off for promoting spore-dissemination, the capillitium; and contemporaneous with this modification we find the ascigerous mode of spore-formation being replaced by the basidiosporous method.

Now this is the sequence presented in the evolution of the *Gastromycetes* before mentioned; why should it be necessary, when the subterranean *Tuberaceæ* evolve above-ground sections, that the original ascigerous condition should be replaced by a basidiosporous stage? It is certain that the entire group of the *Gastromycetes* have sprung from the *Tuberaceæ*, and it is equally evident that the efforts to change an entirely subterranean condition for an above-ground one at maturity is closely connected, if not entirely concerned, with securing a more perfect method of spore-dissemination; remembering that the structure of the primitive stock—the *Tuberaceæ*—consists of a hymenial portion producing spores in asci entirely surrounded by a stout wall, spore-dispersion depending on general decay, or in some instances the entire fungus is eaten by animals, and the spores consequently removed; nevertheless it is obvious that such a structure must undergo a considerable amount of modification on emerging above ground before the desired freedom and facility in spore-diffusion is attained.

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* 'A Monograph of the British Gastromycetes,' Ann. Bot. vol. iv. pp. 1—101, 4 plates.

We have evidence of four distinct attempts to effect this object by the subterranean prototypes of the modern above-ground *Gastromycetes*, and if we estimate the success of each attempt by the numbers and distribution in space of its respective members, we find that three out of the four have proved failures, the successful idea being that which evolves from the conversion of asci into basidia, combined with a copious, more or less elastic capillitium, this being the structure of all the above-ground *Gastromycetes*, and the one from which, as already explained, the yet more perfect spore-diffusion through insect-agency evolved.

Of the three unsuccessful attempts to adapt the subterranean structure to aërial requirements may be mentioned:—(1) The total suppression of the outer thick protecting wall or peridium, leaving nothing but the hymenial portion, part of which was necessarily exposed, as in *Gautiera;* this scheme, so far as is known, only extended to one genus, containing two species. (2) The outer peridium pierced by a terminal aperture, thus following the idea characteristic of the *Sphæriaceæ*, kept up by one genus, *Pachyphlœus*, containing but few species. (3) The conversion of that portion of the ascogenous hypha that immediately produces the asci into a basidium, and the development of an abundant, more or less elastic capillitium, as illustrated by the group evolving from *Podaxis* as a connecting-link with the primitive ascigerous stock, and including the genus *Tulostoma*, and in all probability *Batarrea* and *Queletia*. The two first-named genera each contain a considerable number of species, and, as already stated, although comparatively rare, have a wide geographical range, suggestive of antiquity; and possibly the present known species may be looked upon as the survivors of a once more numerous group, illustrative of the earliest attempt on the part of the altogether subterranean *Tuberaceæ* to improve their condition and extend their range, by placing themselves under more favourable surroundings at the period of spore-dissemination.

It is interesting to note that, however far removed the members of the *Gastromycetes* have become from the parent subterranean stock in the matter of spore-diffusion, yet in almost every instance the whole of the differentiation of the gleba up to the period of spore-formation takes place before the fungus is elevated above ground, and without a clear explanation of the sequence of development of the very varied and complicated structures presented by the different sections, it is difficult to realize that the only known idea embodied is, as already stated, a determination on the part of every generic assemblage to outvie its neighbours in providing the most perfect arrangement for securing the world-wide distribution of its own kind.

Accepting the genera *Podaxis* and *Tulostoma* as at present defined, we find the gradual transition from the ascosporous to the basidiosporous type effected as follows. In *Podaxis* it has been shown that the asci generally originate in a crowded manner from special, short, variously-branched, closely-septate hyphæ, but in most species we find along with this typical method certain ascogenous hyphæ sparingly or not at all branched, and with fewer septa; now in *P. Emerici* the last-mentioned exceptional form of ascogenous hyphæ is found to be typical; furthermore, the exceptional mode of spore-formation in most species, where the ascus remains as an outer coat to the spore, is also the rule in *P. Emerici*.

The peculiar nature of the basidia in the genus *Tulostoma* was first described by Schröter,* who shows that in *T. mammosum* these structures originate as short lateral branches from the hyphæ of the spongy gleba. These short lateral branches, after receiving the protoplasm from the parent hypha, are cut off from the latter by a septum near the base; the terminal portion increases in diameter, but remains more or less cylindrical, and is now a basidium, as proved by the appearance of four lateral papillæ, which continue to increase in size, absorb all the protoplasm from the basidium, become cut off from the latter by a septum at the neck, and finally drop off as spores. Schröter has given five figures of the basidia,† each bearing four spores showing the scattered and generally lateral mode of origin; in one example there is a terminal spore, but there is evidently no stereotyped definite position as shown in typical basidiomycetes.

In a young specimen of *Tulostoma pusillum* Berk. I find the same thick, cylindrical, aseptate basidia bearing from six to eight lateral spores, and in Corda's figure of *Tulostoma fimbriatum* the spores are represented as originating in elongated clusters, suggesting the idea of a lengthened basidium covered with numerous spores; this I have had no opportunity of corroborating, nevertheless we see that in the species of *Tulostoma* the basidia originate as lateral branches, and produce lateral spores, irregularly arranged, and variable in number, thus presenting many points in common with the homologous parts in *Podaxis*, in fact only differing in the total absenc of septa in the basidium, and in the wall of the basidium becoming the wall of the spore.

Podaxis Emerici is the existing connecting-link between the extremes of structure met with in *Podaxis* and *Tulostoma* respectively. In an immature specimen of *Batarrea Steveni* I have succeeded in ascertaining that the asci are clavate, and at the apex of the basidia are indications of scars, but the material at command was too imperfect to ascertain the number or mode of attachment of the spores; the capillitium-threads have the spiral thickening inside more distinctly differentiated than in those of *Podaxis*, and sometimes passing into the annular form. That the above remarks were to some extent anticipated by De Bary is shown by the following quotation:—"The differences between the genera *Batarrea* and *Podaxon* and the typical *Lycoperdaceæ* which have been hitherto under consideration, are sufficiently striking to require a special description."*

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* Entw. u. Tulostoma, in Cohn's Beitr. ii. p. 65.

† *Tom. cit.* p. 68 (woodcut).

GEOGRAPHICAL DISTRIBUTION.

The species of *Podaxis*, seven in number, are not abundant anywhere, and being very conspicuous and readily preserved, it is not to be expected that many novelties remain to be discovered, or the range of known species extended to any marked extent. As already remarked, there is a primitive quaintness in the general morphology, which, added to the fact that the known species are confined to geologically old-fashioned places, suggests that we are dealing with the fragmentary remains of a first attempt to emerge from the altogether subterranean habits of the pioneers of our modern group of *Gastromycetes*.

The genus ranges from St. Domingo, California, 116° W. long., to Brisbane, 153° E. long., and from New Mexico, 35° N. lat., to Melbourne, 37° S. lat. All the species are met with in arid, sandy districts. *P. indica* often occurs in numbers on the large hillocks made by ants at the Cape of Good Hope and in Afghanistan; in both places it is eaten by the natives. Africa may perhaps be looked upon as the geographical centre of the genus at the present day. Species have been collected in the Egyptian desert on the east, the Cape de Verde Islands, and from Senegambia, following the west coast to S. Africa, where individuals appear to be far more numerous than in any other known district. The Island of Socotra, where *P. indica* has been collected, forms the stepping-stone to Asia, where two species extend to the Himalayas and Afghanistan, and, by way of a surprise, undoubted *P. indica* occurs in Queensland and Victoria. Finally, a single species, closely allied to, but quite distinct from the Old World species, occurs within a limited area on the Western side of North America. So far as is known, the genus is not represented in Europe or South America.

CLASSIFICATION.

PODAXIS Desv. — Peridium at first subterranean, sessile, concealing the gleba, which is traversed by a central axis; substance of gleba spongy, without distinct cavities or tramal-plates; asci monosporous, produced in dense clusters; capillitium copious or obsolete. The peridium after spore-formation is elevated above ground on a long stem, and at maturity dehisces by becoming irregularly torn, and separating from the stem at its basal point of attachment.

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* 'Fungi, Mycetozoa, and Bacteria,' Engl. ed., p. 317.

Podaxis Desvaux,* Journ. Bot. tom. ii. p. 97 (1809); Fries, Syst. Orb. Veg. pars. i. Plant. Homon. p. 159 (1825). Fries says: "Genus mihi ignotum, *Cauloglosso* forsan analogon." *Podaxon* Fries, Syst. Myc. iii. p. 62 (1829); this is the first time the word *Podaxon* was used, and Fries explains its appearance as follows:—"Nomen πους et αξων derivatum, *Podaxon* scribendum est." Corda, Icon. Fung. v. p. 24 (1842); Sacc. Syll. Fung. vol. vii. pars. i. p. 58 (1888). *Lycoperdon* Bosc. Act. Soc. Hist. Nat. de Paris, tom. i. pars i. p. 47 (1792); Linn. Mant. Pl. p. 313 (1767); Linn. Suppl. Pl. p. 453 (1781). *Scleroderma* Pers. Syn. Meth. Fung. p. 150 (1801). *Mitremyces* Sprengel, Syst. Veg. p. 518 (1827). *Cionium* Spreng. Syst. Veg. p. 529 (1827). *Schweinitzia* Grev. Edin. Phil. Journ. vol. viii. p. 257 (1823).

Desvaux was undoubtedly the first to notice that the species called *Lycoperdon axatum* by Bosc was generically distinct from *Lycoperdon* and *Scleroderma*, consequently his name of *Podaxis* has been restored, the reason given above by Fries for substituting *Podaxon* not being valid; other things being equal, grammatical accuracy is most desirable, but, considering that a generic name is only of symbolic value, it is best to adhere to the original symbol, thereby avoiding the inevitable complication following any tampering with the original name.

All the species appear to be white when young, the peridium and stem passing at maturity to a dingy ochre, varying more or less in intensity, but of no specific value; neither is the great variability in texture of the peridium, which varies from polished to fibrillose or squamose in the same species; whereas the colour of the spores when mature appears to be constant. The colour of spores described as seen in the mass is as it appears to the naked eye, whereas the colour of individual spores is as seen under the microscope by transmitted light.

A. *Capillitium abundant, threads coloured.*

1. Podaxis indica (Spreng.).—Peridium elliptical, even, rather polished; basal margin irregularly lacerated after dehiscence; stem elongated, attenuated upwards, hollow, more or less incrassated at the base; mass of capillitium and spores dark reddish brown; capillitium very dense, threads simple or rarely branching at wide angles, bright brown, very much curled and intertwined, 9–11 μ thick, spiral marking distinct, often splitting into a flat, spirally-coiled ribbon; spores bright brown, irregularly globose or broadly elliptical, 10–12 or 10–12 × 9–10 μ, smooth.

Mitremyces indicus Spreng. Syst. Veg. v. 5, p. 518. *Scleroderma pistillare* Pers. Syn. Meth. Fung. p. 150. *Lycoperdon pistillare* Linn. Mant. Pl. p. 313. *Schweinitzia pistillaris* Grev. in Edin. Phil. Journ. vol. viii. p. 257, pl. vi. (in the text the spelling of the generic name given in honour of Schweinitz, the mycologist, is correct, but on the plate it is "Schweinizia," and this mistake is copied by Fries, S. M. iii. pp. 62–63). *Podaxon pistillaris* Fries,

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* 'Observations sur quelques genres à etablir dans la famille des Champignons.'

Syst. Myc. iii. p. 63; Sacc. Syll. vol. vii. pt. i. No. 171. *Podaxon arabicus* Pat. Bull. Soc. Myc. vol. iii. p. 122, pl. xi. f. 1 (1887).

Peridium 7–10 cm. high by 3–4 cm. broad; stem 10–17 cm. long, and about 1 cm. thick below; the bulb-like base of the stem is mostly due to sand being firmly agglutinated together by the mycelium.

Hab. In dry sandy places, or on the nests of termites. Edible. South Africa (*Prof. MacOwan*); Porto Praya, Cape de Verde Is. (*Sir J. D. Hooker*); Niger Exp. (*Barter*); Socotra (*Prof. I. B. Balfour*); Madras; Rawul Pindee, Punjab; Himalayas; Afghanistan (*Dr. Aitchison*); Victoria and Queensland, Australia.

2. PODAXIS CARCINOMALIS (Linn.). — Peridium oblong-ovate or broadly elliptical, smooth, then often more or less fibrillose, lower free margin irregularly torn; stem elongated, very much attenuated upwards, hollow, base swollen and often oblique; mass of capillitium and spores dark umber-brown; capillitium dense, threads thick-walled, bright brown, simple or rarely branched, very much twisted and interlaced, spiral marking distinct, often breaking up into a flat, spiral ribbon, 10–12 μ thick; spores bright brown, smooth, elliptic-oblong, 10–12 × 6–7 μ.

Lycoperdon carcinomalis Linn. Suppl. Pl. p. 453. *Podaxon carcinomalis* Fries, Syst. Myc. iii. p. 62; Sacc. Syll. No. 168; Fischer, Hedw. 1889, Heft i. p. 1, t. 1, figs. 1–2. *Podaxon elatus* Welw. & Curr. Trans. Linn. Journ. vol. xxvi. p. 288, pl. 19, f. 4–6. *Scleroderma carcinomale* Pers. Syn. Meth. Fung. p. 151.

The type-specimen of Linnæus is in the Linnean Herbarium, now in the possession of the Linnean Society, and the type of Welwitsch & Currey is in the Kew Herbarium.

The peridium varies from 7–20 cm. in height by 5–12 cm. in breadth; the stem is also variable in proportion, 12–40 cm. long by 1–3 cm. thick towards the base.

The present species is most closely allied to *P. indica*, but is altogether a larger and more robust plant, and well characterized by the spores and the stouter stem with the usually oblique swollen base.

Hab. Sandy places, and on nests of white ants. Niger Exped. (*Barter*); Uitenhage (*Zeyher*); South Africa; S.W. Africa (*Dr. Schinz*); Angola (*Dr. Welwitsch*).

Var. *minor* Berk. in herb.—Very much smaller and more slender than the typical form, but capillitium and spores exactly the same.

Hab. On the ground. Entire plant 6–7 cm. high. Natal.

B. *Capillitium very scanty or obsolete.*

3. PODAXIS AXATA (Bosc.). — Peridium elliptical, smooth or fibrillose, usually torn into irregular, pointed segments at the lower, free margin; stem elongated, attenuated upwards, fibrillose and usually twisted, hollow, base bulbous; mass of spores olivaceous-umber; capillitium rare or altogether obsolete; spores variable in form, broadly elliptical or irregularly subglobose, dusky olive with a brown tinge, wall thin, 13–14 or 13–14 × 10–11 μ.

Lycoperdon axatum Bosc. Actes de la Soc. d'Hist. Nat. de Paris, tom. i. pars i. p. 47, plate xi. (but called pl. vi. in the text), (1792). *Podaxis senegalensis* Desv. Journ. Bot. tom. ii. p. 97. *Cionium senegalense* Spreng. Syst. Veg. p. 529. *Podaxon calyptratus* Fries, Syst. Myc. iii. p. 63; Sacc. Syll. No. 170. *Podaxon Loandensis* Welw. Apont. Fl. Angol. p. 535; Welw. & Curr. Trans. Linn. Soc. v. 26, p. 288, tab. 20, f. 5, 6, 7.

There is an authentic specimen of *P. Loandensis* from Dr. Welwitsch in Herb. Berk., Kew, No. 4532.

Peridium 6–8 cm. high; stem 10–17 cm. long, coarsely fibrous, the fibres in a diffuse spiral owing to the twisting of the stem, base very much incrassated; spores always with an olive tinge.

Hab. Dry sandy places. Edible. Senegal; Angola (*Dr. Welwitsch*); Ugui, E. Africa (*Mus. Brit.*); Ceylon (*Gardiner*); Niger Exped. (*Barter*).

4. Podaxis Mossamadensis (Welw. & Curr.).—Peridium elliptical or conical when expanded, often irregularly longitudinally rugose, lower margin irregularly torn; stem elongated, subequal or slightly attenuated upwards, stuffed, base bulbous; mass of capillitium and spores blackish brown; capillitium very scanty, threads without spiral markings, 8–9 μ thick; spores subglobose, deep brown, 8–9 μ diameter.

Podaxon Mossamadensis Welw. & Curr. Trans. Linn. Soc. v. xxvi. p. 288, t. 17, f. 3 (spores), & t. 19, f. 1, 2, 3.

Type in Herb. Mus. Brit.

Peridium 7–12 × 4–7 cm., stem 15–27 cm. high, 1–2 cm. thick; the stem is sometimes swollen just within the point of attachment of the base of the sporangium. The minute apiculus on the spore mentioned in the original description is caused by a thickening of the epispore immediately over the germ-pore; a similar projection is present in every species, but is more pronounced in the present. Characterized by the stout, subequal, stuffed stem with a bulbous base, and the small globose spores.

Hab. Sandy places. Mossamedes, Angola (*Dr. Welwitsch*); Madeira (*Lowe*).

5. Podaxis Ægyptica (Mont.).—Peridium narrowly elliptical or oblong; stem subequal, fibrous, more or less twisted, base incrassated; mass of spores rusty-brown; capillitium very scanty; spores broadly elliptical, dark reddish brown, 11–12 × 9 μ.

Podaxon Ægypticus Mont. Syll. Cr. No. 1044; Corda, Icon. Fung. vi. p. 18, t. 3, f. 44; Fischer, Hedw. Heft. i. (1889), pl. i. figs. 3, 4, 5. *Cauloglossum Ægypticum* Sacc. Syll. No. 167.

Type in Herb. Mus. Par.

The smallest species known; peridium 4–5 × 2 cm., stem 6–7 cm. long.

Hab. Sandy places. Desert of Gaza, near Suez; S.W. Africa (*Dr. Schinz*).

6. **Podaxis Farlowii** Mass., n. sp.—Peridium obovate-oblong, apex very obtuse, free basal margin irregularly lacerated; stem elongated, subequal, often twisted, stuffed, only slightly or not at

all swollen at the base; mass of spores blackish brown; capillitium-threads very rare, with indistinct spiral markings; spores irregularly globose or broadly elliptical, smooth, clear dark brown, 10–12 or 10 × 12 μ.

The present species is characterised by the peridium being very obtuse and broadest at the apex, the stuffed, subequal stem, and subglobose, brown spores. Peridium 6–8 × 3–4 cm., stem 14–18 cm. long.

"Arizona, *Dr. Palmer, Herb. W. G. Farlow*" specimen sent to Berkeley, now at Kew, and accepted as type of the present species. New Mexico (*Gerard*, No. 287); Rio Grande, N. Mexico (*Wright*).

7. Podaxis Emerici (Berk.).—Peridium elliptic-oblong, covered with dark-coloured, squarrose, fibrillose scales; stem elongated, attenuated upwards, hollow; mass of spores olive-brown; spores broadly elliptical, smooth, with a distinct apiculate hilum, olive with a tinge of brown, 20–22 × 12–14 μ; capillitium obsolete.

Podaxon Emerici Berk. in herb. — Peridium 6–8 × 4 cm., stem 14–16 cm. long. Characterized by the scaly peridium and the large olive spores.

Musalapatam, Himalayas (*Capt. Emeric Berkeley*).

Description of the Figures on Plates 294 and 295.

Plate 294.—Fig. 1, *Podaxis indica*, vertical median section of a young specimen before differentiation of the gleba; nat. size. 2, *P. indica*, vertical median section of young specimen after differentiation of the gleba, *a;* central axis, *b;* peridium, *c;* basal portion that eventually elongates and forms the stem, *d;* nat. size. 3, *P. indica*, portion of an ascogenous branch; × 1200. 4, *P. indica*, portion of an ascogenous branch with empty, shrivelled asci; × 1200. 5, *P. indica*, an ascus containing two immature spores; × 1200. 6, *P. indica*, portion of a capillitium-thread showing the spiral marking, and at one end broken up into a flat, spirally-coiled ribbon; × 1200. 7, *P. indica*, diagrammatic section of a capillitium-thread showing the ridges on the inner surface of the wall arranged spirally. 8, *P. indica*, hyphæ from young specimen; × 1200. 9, *P. indica*, spore in optical section, showing the germ-pore; × 1200. 10, *Podaxis carcinomalis*, a small ascogenous tuft; × 1200. 11, Diagrammatic median vertical section of an ascogenous branch of *Podaxis Emerici*, showing the incrassated branch with but few septa; if this is compared with the basidia of *Tulostoma*, fig. 12, it will be seen that the only morphological distinction between the two consists in the absence of septa in the latter. 12, *Tulostoma pusillum*, basidia with spores; × 400. 13 & 14, spores of above in different stages of development; × 1200. 15, *Elaphomyces variegatus*, portion of an ascogenous hypha with asci in various stages of development; × 400. 16, 17, 18, asci of same containing one, two, and four spores respectively; × 400.

Plate 295.—Fig. 19, *Podaxis Farlowii*, entire fungus; nat. size. 20, spores of same; × 350. 21, spore of same; × 1200. 22, *Podaxis Emerici*, entire fungus; nat. size. 23, vertical median section of same; nat. size. 24, spores of same; × 350. 25, spore of same, showing hilum, *a;* and germ-pore, *b;* × 1200. 26, spore of same, showing outer membrane of spore split and partly removed; × 1200.

FURTHER RECORDS FROM ICELAND.

By Arthur Bennett, F.L.S.

In this Journal for March, 1886, I recorded the additions to the Flora of Iceland, made after the publication of ‘Groenlund's Flora’ in 1881.

I here propose to notice those that have since been added up to 1889, and to endeavour to show what is still required to clear up many points connected with Icelandic Botany. Naturally, it is to the Danish botanists we look for the principal part of this work; but still British botanists, entomologists and tourists, can aid very materially. One difficulty is to know what is wanted, and to some extent to obviate the gathering over again of plants well known to exist in the island. I have given a list, at the end of this paper, of records needing to be confirmed by specimens, confining myself, however, to those numbered by Prof. Babington in his “Revision of the Flora of Iceland,” in the Linnean Society's Journal, 1870, pp. 282—348.

If any one visiting Iceland should see any of these plants, they will do a service to Icelandic Botany by submitting them to Prof. Babington, or Dr. Lange, of Copenhagen.

A good many (perhaps most) of the species not numbered are geographically unlikely to have ever occurred. One factor is evidently gaining ground in Iceland, *i. e.*, the introduction of plants that accompany cultivation, such species as *Melilotus alba*, *Bromus secalinus*, &c., are, as Rostrup observes, merely weeds.

The principal papers that have appeared on the Flora are by M. Halldórsson Fridriksson, in the ‘Bot. Tidsskrift,’ 1882, pp. 45—78, “Om Islands Flora.” In this he criticises the work of Groenlund, in his ‘Islands Flora,’ and defends the work of his countryman, Hjaltalin, ‘Islenzk Grasafræd,’ from Groenlund's certainly harsh estimation of it,—“It is perfectly indifferent what plants figure, or are named in that list,”—and cites the totally different value that Babington placed on it. This was followed by Groenlund, in the same year and place (pp. 83—131), with a paper in which he discusses Fridriksson's criticisms. In these two papers the value of the records of over one hundred species are reviewed by Fridriksson and Groenlund. It should be stated that Groenlund's standard was a specimen in some herbarium; but here he was not consistent, for (seemingly because Babington recorded several plants as in “Solander's Collection” but not localised, which in his ‘Flora’ he ignored); he was obliged to pass over several gathered by Steenstrup and only labelled “Iceland,” and Fridriksson calls attention to these.

The latest paper is that of Dr. E. Rostrup, in ‘Bot. Tidsskrift,’ 1888, pp. 168—186. He there records the new localities and new species found by Feddersen, Davidsson, Stefansson, Thorsddsen, and Froeken Thora Fridriksson.

The following list contains these additions; and it may be of interest to see how many of the species that were numbered by

Babington, but not admitted by Groenlund in 1881, have since been verified. They amounted to 132 species, and of these 33 have been gathered. Of the remaining 99 species there are from 50 to 60 that are not unlikely to be found, looking at their distribution elsewhere. Those starred are the additions, the others being merely new localities or corrections, &c.

By the kindness of the Rev. Dr. Walker, who visited the island last year, I was enabled to look through the plants he collected, and to include in this list a few additions made by him.

There is one point in which I think the Danish botanists are hardly fair to those who have gone before. If a plant has been reported, it seems only right that the old record should be given as an appendage to the recent one, if even only from the historical point of view. One instance will suffice: *Glaux maritima* was given for Leüarey by Koega in Olafsen og Povelsen's 'Reise ignenem Island,' and by Baring-Gould and W. Lauder Lindsey from other three stations. This was afterwards found by Fridriksson at the same place, and recorded by Groenlund, 'Bot. Tidssk.' vol. 14, part 4, without the slightest reference to its having been found there before.

Ranunculus heterophyllus Fr., var. *succulenta* Koch. Langarnar, near Reykjavik. W. Isl. (Davidsson). I suspect this is the plant that Babington describes, but gives no name to.

Cardamine intermedia Hornem. Borgarfjördr (Thoroddsen ex Groenlund). Hver, near Graferbakki. Múli, near Geysir. Minni Laxá. S. Isl. (Feddersen).

**Silene inflata* Sm. Eskijördr. E. Isl. Rev. Dr. Walker, a scrap just sufficient to identify the species! Included by Lindsey, Preyer and Zirkel, Hjaltalin, and Gliemann. Not recorded for the Faroes or Greenland; in Finland and Lapland North to 69° N. lat.

**Geranium molle* L. Hallbjarnareyi, W. Iceland (Davidsson). Doubtless an introduced species. It grows in Sweden north to Vermland; in Finland in the Aland Isles only,

**Malva borealis* L. Blönduós, N. Iceland (Fridriksson). Scarcely a native of Iceland. It occurs in Sweden; in Norway to 60° 43′ N. lat.; Finland to 62° N. lat. (doubtfully to 63°).

**Melilotus alba* Lam. Blönduôs, N. Iceland (Fridriksson). Doubtless an introduction.

Trifolium pratense* L. Hafnarfjödr, W. Iceland (Froeken Thora Fridriksson). Given in many of the old lists. In Lapland it extends to 64° 30′ N. lat,; in Finland to 68° N. lat.—T. minus* Sm. Solander in Herb. Mus. Brit. *teste* Britten; Journ. Bot. 1886, p. 68, note.

**Lotus corniculatus* L. Hallbjarnareyri. Snæfellsnes, W. Iceland (Davidsson). Given as Icelandic by Hjaltalin and Mohr, and recorded from the Faroes and Finland up to 63° N. lat. In Norway (Arctic) to 71°.

**Alchemilla fissa* Schum., var. *faeroensis* Lange Seythisfjödr, E. Iceland (Davidsson). Rostrup has a long note on this, and it is no doubt the plant that Strömfelt reported as *A. conjuncta* Bab. (see Journ. Bot. 1886, p. 69).

Callitriche autumnalis L, Laxá, N. Iceland. No locality given in Journ. Bot. 1885. p. 69.—**C. hamulata* Kütz. Bægisá, N. Iceland. Midá, Haffjarthará and Hitará, W. Iceland. Unthiafoss and Breidabólstadr, S. Iceland (Fridriksson). Auiltrasser, 1, 8, 1856; Haudinger in herb. A. Braun, Berlin, *fide* Dr. Roth.; "Island, Thienemann in herb. Berol."; Hegelmaier, Monogr. Gatt. *Callitriche* p. 57.

Sedum annum L. Myvatn, Thoroddsen, 1884, in herb. Beeby!—*S. villosum* L., var. *glabra* Rostrup. Seydisfjörthr, E. Iceland, (Feddersen.)

**Saxifraga Aizoon* Jacq. Seydisfjörthr, E. Iceland (Davidsson). Recorded from Hafnarfell (Steenstrup).

**Daucus Carota* L. Eskifjörthr, E. Iceland (Rev. Dr. Walker, 1889!). A small tufted form with many stems from the roots, three inches high, several flowery stems from same root, habit of a wild plant, and seemingly native. It was named for me by Mr. N. E. Brown. How far this may be accepted as a native it is difficult to say; its distribution rather lends itself to the idea that it may be so. In Norway it occurs near Christiani, about 60° N. lat.; in Russia , just north of 60°; in Asiatic Russia at 50°, 55° and 59°. "In Fennia australis interdum efferata," Herb. Mus. Fennici, p. 136 (1889). It is not recorded for the Faroes. In the Shetland Isles it was given as abundant by Edmonston, but Mr. Beeby has not yet met with it. It may be native in Caithness. But it belongs to an order that (with some exceptions), rapidly thins out northwards. It is recorded as far as 63° 7′ N. lat. in Norway, but on "ballast." Dr. O. Nordstedt writes that in Sweden it occurs in a native state at Upsala, about 60° N. lat.; at Nagunda and Ostersund in Jemtland, at about 63° N. lat.; but is not given by Svenison in his 'Flora ofver Norrlands Karlväxten,' 1885.

Galium trifidum* L. Hrappsey by Breidifjördr (Gudm Magnussen ex Davidsson. Gliemann and Hornemann included this in their Icelandic plants. "In Hornemann's Herb. Island," Fridriksson, *l. c.*—G. sylvestre* Poll., var. *supina* Gaud. Gothaland, near Thórsmörk, S. Iceland (Feddersen).

**Filago germanica* L. Reynistadr, N. Iceland (Davidsson). Doubtless introduced.

**Hieracium crocatum* Fr. Given for Iceland by Fries, in his 'Epicrisis gen. Hieraciorum,' 1862, p. 125. Rostrup remarks that an Icelandic specimen is like *H. sparsifolium* Lindb. The specimen has been sent to Dr. Lindeberg for him to determine.

**Campanula uniflora* L. Hoffjall, near Mödrivellir. Hörgárdair, N. Iceland (Davidsson).

[*Gentiana verna* L. "Olafsen's Island." The following note, in Sommerfelt's 'Supp. Fl. Lapp.' p. 13, under *G. nivalis* L., disposes of the record of *G. verna* as an Icelandic plant:—"Sine dubio *G. verna*, Olaf's Island."]

**Chlora perfoliata* L. Rev. Dr. Walker, 1889! An introduction, but from whence is curious, as it is not recorded for any Scandinavian country.

**Erythræa Centaurium* L. Less likely than *Chlora* to be introduced, but still very dubiously a native. Rev. Dr. Walker, 1889! Found in Finland at Euraåminne, about 61° N. lat.; in Sweden; in East Gothland; and Södemanland.

Myosotis arvensis Roth. Eskifjördr. Rev. Dr. Walker, 89!

**Anagallis arvensis* L. Reykiavk (Davidsson). Babington notes, "Solander saw it in Paulsen's herb."

**Utricularia minor* L. Minni Laxá, S. Iceland (Fridriksson).

**Pinguicula vulgaris* L., var. *grandiflora* Lam. Seydisfjörthr (Feddersson), E. Iceland.

Rhododendron lapponicum Wg. "Kalmanstunga, Baring-Gould." Rostrup records a specimen in the Copenhagen Herbarium, "ex Islandia dedit Robert, 1837, Aug."

Polygonum Convolvulus* L. Blönduós, N. Iceland (Fridriksson). Affaldsdynger (Federssen), "with *Melilotus*, *Malva borealis*, &c." Gliemann included this, and it is recorded from Lapland and Norway to 70° N. lat.; in Finland to 69° in cultivated land; but is doubtless an introduction to Iceland.—P. Persicaria* L. Neykri in Mosfellssveit (Thoroddsen).—**P. aviculare* L., var. *littorale* Link. North coast, July 1889. Rev. Dr. Walker!

**Plantago Coronopus* L. "I found this plant in Iceland in 1861, but although I noted its occurrence, neglected to take specimens, supposing it to be frequent" (I. Carroll in Journ. Bot. 1870, p. 356). I found a solitary example among Dr. Walker's plants gathered in 1889. König and others recorded it.

Oxyria digyna Camp. Eskifjordr (Rev. Dr. Walker, 1889).

Orchis latifolia L., var. Near the Geysers, 1889 (Rev. Dr. Walker!). Mr. N. E. Brown kindly determined these specimens, which were poor, hence uncertain. I doubt their belonging to *latifolia*. Hafnarfjordr (Froeken Thora Fridriksson). Rostrup as *O. majalis* Reich.

Platanthera hyperborea Lindley! Near the Geyser (Rev. Dr. Walker, 1889!). Many specimens of this species (the var. *minor* of Lange). Very different in aspect from the Greenland plant (ex Lange!), but I compared them with Lindley's types at Kew.

**Potamogeton pectinatus* L. Vestmannsvatn. Blanda and Vididalsmdri, N. Iceland. Hvammsfjordr, Langá, Hvit. It was recorded by Morck (Langafjord) and Baring-Gould (Vithimyri). Morck evidently places this apart from *filiformis*, as he gives a name to that plant, so his locality is probably correct.—*P. filiformis* Nolte. In Herb. Mus. Brit. is an Icelandic specimen gathered by Morck, under the name of *P. capillaceum*, 1821. A specimen of *P. rufescens* Schrad., from Helgá, Rostrup refers to "var. *salicifolia* (Wolf) =(*P. lanceolatus* Sm.)." This will mean the *salicifolius* of Reichenbach's 'Icones,' and not the plant of Smith. All the Icelandic plants named "*lanceolatus* Sm." I have seen are forms of *rufescens*.—*P. polygonifolius* Pourr. Recorded by Feddersen (Medd. Bot. Foren. s. 159), seems according to Rostrup *l. c.*, to have been a form of *P. natans*.

Luzula multiflora Lej.—*Var. *congesta* Fr., and var. *pallescens* Hoppe. Hrappsey, E. Iceland (Davidsson).—*Var. *nigricans* (Desv.). Sandy by Thingvallavtn (Feddersen).

**Zannichellia polycarpa* Nolte. Myvatn, N. Iceland. Lang, near Torfastadir, S. Iceland (Fridriksson). Given without locality in Journ. Bot. 1886, p. 70.

Sparganium minimum Fr. Melstadr, N. Iceland, Hvitárvellir and Laxá, W. Iceland (Fridriksson). Babington's record uncertain. —*S. natans* L. Journ. Bot. 1886, p. 70; see Rostrup, *l.c.*, p. 183.

Eriophorum angustifolium Roth. Thingvellir (Rev. Dr. Walker, 1889!).

**Carex lævirostris*, Blytt. Hvitárvellir, W. Iceland (Feddersen).

**Bromus secalinus* L. Blonduós, N. Iceland (Fridriksson). — *B. racemosus* L. Hólasandr, near Myvatn, N. Iceland. These two grasses probably introduced, the first almost certainly so. Rostrup notes that a specimen of *Bromus brizæformis* Fisch., from "Blondadalsbakki," gathered by B. Thorleifson, is in the Copenhagen Herbarium.

**Polypodium vulgare* L., var. *brevis* Lange. Thurrá and Hveragerdi by Olves (Thoroddsen ex Groenlund).

**Botrychium lanceolatum* Gmel. Angestr. Hofskard, near Modruvellir, N. Iceland (Davidsson).

**Equisetum scirpoides* Michx. Eyjafjordr., N. Iceland (Fridriksson). — **E. arvense* L., var. *alpestre* Wahlenb. Gæsavatn. Grimsey (Thoroddsen ex Groenlund).

Ceterach officinarum W. "Island" in Roth Addit. ad Consp. Fl. Europ. was an error for "Istria"; *fide* Dr. Roth *in litt.*

List of plants recorded for Iceland, but which have not been confirmed by recent authors, and of which specimens are wanted:—

Ranunculus lapponicus L. Between Hankadal Church and Langafjall, in the morass. Hooker.—*R. polyanthemos* L. Eydar on the Lagarfljót (Thienemann and Günther).

Cochlearia danica L. Sp. in Solander's Coll., Babington, *l. c.*

Draba muralis L. In several lists.

Teesdalia nudicaulis R. Br. Solander in Herb. Mus. Brit., Babington, *l. c.*

Lepidium campestre R. Br. Several lists.

Drosera longifolia L. (probably *anglica ?*). König and Müller, 1770.

Sagina subulata Wimm. Gliemann and Morck.

Hypericum perforatum L. Gliemann.

Geranium pratense L. Gathered by Solander, Babington, *l. c.*

Arenaria serpyllifolia L. Hafnarfjördr (Solander).

Stellaria borealis Big. Statharfell and Borgarfjord. Steenstrup.

Cerastium arvense L. Fjallabaksvejen, in the south of the island. Steenstrup. This has been found in Greenland.

Geranium phæum L. Several lists.

Trifolium arvense L. Akreyi (Baring-Gould).

Myriophyllum verticillatum L. Hafnarfjörthr (Solander).

Scleranthus annuus L. "In all the lists" (Babington, *l. c.*).

Sedum anglicum Huds., and *S. album* L. (Gliemann & Hjaltalin).

Saxifraga petræa L. Osceraa, Köega, and Mohr. Hafnarfjörthr (Solander).—*S. granulata* L. (Gliemann).

Ægopodium Podagraria L. In Skalmersdale Coppice (Gliemann).

Galium Aparine L. (Preyer and Zirkel).—*G. saxatile* L.(Leared), *G. palustre* L. This certainly would seem to be a very likely plant. "In all the lists" (Babington, *l. c.*).

Artemisia vulgaris L. (Solander).

Antennaria dioica Gært. Between Thorkafjad and Thingmansheidi (Olafsen and Povelsen).

Senecio Jacobæa L. On the Heithies (Baring-Gould).

Carduus heterophyllus L. Œfjad. Olafsen. Akreyi (Ol & Po.).

Crepis præmorsa Tausch. Hafnarfjörthr (Solander).

Hieracium Pilosella L. Hafnarfjörthr. Briamsloch (Solander). —*H. auricula* L. Hafnarfjörthr (Solander). Myvatn, Mohr.—*H. cæsium* Fr. The doubt about this is, what is the plant that has been gathered? Groenlund says *murorum*, but Babington considers the specimens he has seen to be *cæsium*.

Arctostaphylos alpina Spr. Named by many of the authors.

Echium vulgare L. Rödesand (E. O. & P.).

Myosotis palustris With. Hafnarfjörthr and Granfell (Solander). Hof in Vatnsdal (Baring-Gould).

Pedicularis sylvatica L. Hafnarfjörthr, Molar (Solander). Lagarfljòt (Gliemann).

Lamium album L. Hnausir (Baring-Gould), Hjaltalin.

Stachys sylvatica L. Fnjorhadalr (Baring-Gould).

Pinguicula alpina L. Borgarfjord (Pjetursson),

Primula farinosa L. Crossnaes (Gliemann).

Plantago alpina L. (?). Thingvellir in plenty (Hooker). Probably *P. borealis* Lange.

Atriplex hastata L. Reykjavik (Babington).

Polygonum amphibium L. "In all the lists" (Babington, *l. c.*). —*P. Hydropiper* L. "In all the lists" (Babington, *l. c.*).

Ceratophyllum demersum L. "In all the lists" (Babington, *l. c.*).

Salix pentandra L., and *S. purpurea* L. Thingvellir (Baring-Gould).—*S. Caprea* L. East side of the head of Eyjafjord (Mohr). Seljadal (Baring-Gould).—*S. cinerea* L. Ljósavatn (Baring-Gould). —*S. laurina* Sm. Island? (Warming).—*S. myrtilloides* L. Hafnarfjörthr (Solander). — *S. repens* L. Eylifr. Ljósvatn (Baring-Gould).—*S. Myrsinites* L. Hafnarfjörthr (Solander).—*S. arbuscula* L. Eyafjörd (Thieneman & Günther).—*S. reticulata* L. Olafsvik (Mœrck).

Orchis Morio L. Grimstunga (Baring-Gould). — *O. mascula* L. Hafnarfjörthr (Solander). On the way to Krisuvig (Hooker). Groenlund says, when on a tour from Reykjavik to Krisuvik he saw only *maculata*.—*O. cruenta* Müll. Raugarvalla (Mörck).

Nigritella nigra Rchb. "In all the lists" (Babington, *l. c.*).

Maianthemum bifolium DC. "In most of the lists" (Babington, *l. c.*). A very curious error is here suggested—was it *Hydrocotyle vulgaris?*

Juncus effusus L, Reykjavik and Eyjafjord (Baring-Gould). — *J. Gerardi* Lois. Molar, Langarnes, Geysirs (Solander).

Luzula pilosa Willd. Eyafjord (Thieneman and Günther).

Potamogeton lucens L. Hafnarfjörthr (Solander). Likely enough confused with *rufescens* as often done now.—*P. crispus* L. Myvatn (Glieman). Pond above the hot springs at Langarness (Lindsey).

Blysmus compressus Panz., and *B. rufus* Link. Hóp (Baring-Gould).

Scirpus lacustris L. Reykjavik (Baring-Gould). Esia (Mörck).

Eriophorum latifolium Hoppe. Recorded by three authors.

Carex pulicaris L., *C. arenaria* L., *C. vulpina*, L., *C. muricata* L., *C. loliacea* L., *C. elongata* L., *C. pallescens* L. These records are in some cases pointed out as errors by Drejer in his Revisio Car. boreal.—*C. fuliginosa* Sternb. König.—*C. flava* L., and *C. vesicaria* L. "In all the lists" (Babington, *l. c.*).

Milium effusum L. Near Kaldrananes (Mohr).

Psamma arenaria Beauv. Near Kinnæstadt (Thieneman and Günther).

Calamagrostis Epigejos Roth. (Lindsey).—*C. varia* Vahl (Vahl).

Aira atropurpurea Wahl. (Hornemann).—*A. præcox* L. Several authors.

Molinia cærulea Mœnch. Havn Ledelos (Mohr). Eydar on the Lagarfljót.

Poa flexuosa Wahl. (Vahl).—*P. compressa* L. Many of the lists.

Dactylis glomerata L. In many lists.

Festuca arundinacea Schr. In many lists.

Triticum caninum L. In many lists.

Equisetum sylvaticum L. Copse near Langarvatn (Baring-Gould).

Isoetes lacustris L. Thinvellir-vatn (Hooker).

Lycopodium clavatum L., *L. complanatum* L. In some lists.

Polypodium alpestre Hoppe. Stad under Snæfell. Steenstrup.

Lastrea Thelypteris Presl. "In all the lists" (Babington, *l. c.*).

Asplenium fontanum Presl. Thingvellir (Baring-Gould).

BENJAMIN CLARKE, F.L.S.

Benjamin Clarke was born Sept. 5th, 1813, at Saffron Walden. He was articled to Dr. Mayo, of Winchester, and regularly entered the medical profession, but never practised except for a few months on one or two occasions. In fact, even while a student in hospital, he had become devoted to the study of Natural History, especially of Botany; and his researches formed the main occupation of his life. The Royal Society's Catalogue attributes to him nineteen papers, of which three appeared in this Journal for 1865. Two more recent contributions from his pen in this Journal for 1886 and 1887 will be found. These papers treat of very varied subjects; but a majority of them lead up to his principal separate work, 'The Natural System of Botany.' In his early days he attempted to fix the position of various orders and genera, of which the affinities were not settled, by ascertaining the position of the carpels with reference to the axis and the position of the raphe (lateral or dorsal) of the ovule. Mr. Clarke was skilful in dissection, well-grounded in morphology, and an able draughtsman; and many of the plates which illustrate his papers are excellent. Mr. Bentham, in his anniversary address to the Linnean Society in 1862, referred to Mr. Clarke as " one of our most careful observers." He was led on to pay special attention to the two characters (orientation of the carpels and of the raphe), and thence by an easy transition, to attribute a supreme classificatory importance to them. As early as 1851 he put forward his 'Outlines of a new arrangement of the Orders of Exogens,' which was ultimately expanded into '*The* Natural System of Botany.' This, under the title, 'A New Arrangement of Phanerogamous Plants,' was first published in 1866, and a third edition was issued in 1888. Probably no botanist of the present day supposes that any one true Natural System of Botany exists; any useful system must be founded on a due recognition of all characters, and not on a few only whereof two are given huge prepotence.

Other systematists have not been able to employ for their larger divisions the two particular characters which Mr. Clarke fastened upon. Except when the carpels are two, it is often difficult to prove inferentially (Mr. Clarke attempted it), whether they are "anterior-posterior" or "lateral" with respect to the axis. In a very large number of exogens the carpels are two, but their orientation appears variable in one order and even in one genus; see the diagrams illustrating *Oleaceæ*, in Eichler's 'Bluthendiagramme,' v. i. p. 235. Mr. Clarke showed much ingenuity in reducing these variations by imagining a twisting of the pedicel, &c. Hardly less difficulties attend the employ of the position of the raphe. Mr. Clarke narrowed the application of this character to the case of the anatropous ovule, but even then there are numerous cases in which the raphe is neither definitely dorsal nor clearly lateral, but betwixt and between. The matter appears to stand that these two characters are like many other characters employed by systematists; they are very constant, and of much value in determining affinity, and carry the classificator a long way; then a series of cases is met with in which they appear to become inconstant in closely allied plants.

But if Mr. Clarke has not persuaded the scientific world to accept *The* Natural System of Botany, he has published, in his attempts to establish the system, the record of an immense number of valuable observations. There remain unpublished at Kew scattered analyses by him; one of these was made use of by Sir J. D. Hooker, in his paper on "*Hydrothrix*," in the 'Annals of Botany' (i. p. 89, t. 7). It is to be regretted that Mr. Clarke should have devoted his rare combination of botanic and artistic ability to the propping up of a pet theory, instead of to some steady morphological work, wherein he could hardly have failed to attain great distinction.

The period of Mr. Clarke's greatest botanical activity was from 1849 to 1865. During the last twenty-five years of his life, his main botanical work was the perfecting of 'The Natural System of

Botany,' by explaining all recorded instances of structure which did not fit in well with that system. He was also engaged in studying the effects of various new (or proposed) vegetable therapeutic agents; and he was interested greatly in the possibility of checking infection, even in towns, by police regulations for the isolation of patients. His amiability of character and intense scientific enthusiasm universally commanded sympathy. Mr. Clarke died very suddenly, of apoplexy, at Hampstead, February 4th, 1890.

JOHN BLAND WOOD, M.D.

Dr. John Bland Wood died at his residence at Withington, near Manchester, on February 11th. He was born Dec. 3rd, 1813, at or near Pontefract, where he received his early education. He subsequently entered the medical profession and studied at Dublin, Edinburgh, and London, as well as in Germany. At Broughton, not then so closely joined to Manchester, he took up his residence and soon established an extensive practice, being elected a Fellow of the Royal College of Surgeons in 1859. His health beginning to fail, about 1875 he gradually withdrew from practice, and about two years ago removed to Withington.

By his death the botanical world loses one of its oldest members, whose name will be less familiar to the present generation than it was to botanists of two or three decades ago, but which still holds a place amongst many who have made British plants, and more particularly British mosses, their study. It will always be to Broughton that the recollections of his old friends will turn as the spot made familiar by his vigorous personality, and there yet remain some in whose minds will never be effaced during life the remembrance of jovial meetings that have there taken place around the hospitable board, at which he so genially and energetically presided; the merry expeditions that have there been planned; the long debates over critical and disputed species, carried on far into the night under the soothing influence of a cloud of grey smoke. Very few botanists have been as careful as he was over the drying and preparation of their specimens, and especially his collections of Grasses, Carices, &c., made during the "forties" and "fifties" were surpassingly thorough and complete. Dr. Wood employed Richard Buxton to collect for him, and paid the expense of his journeys into North Wales and elsewhere: he is referred to, though his name is not mentioned, in Buxton's 'Botanical Guide' (p. x), as "a gentleman who had just begun to study botany," in 1839. In later years it was to the Mosses that he devoted himself with his usual superabundant energy, and he carried on an active correspondence with Wilson, now preserved in the Botanical Department, British Museum, and also with Schimper, Moore, Marratt, and many other collectors; the youngest if they showed promise being always welcome to his advice and assistance, and sure of a series of emphatic lectures on all points of detail.

He was an occasional contributor to the new series of the 'Phytologist' and other Journals, and in 1840 published a Manchester Flora, entitled 'Flora Mancuniensis'; but his published matter represented a very small part of his writing; it was in the form of letters that he preferred to exercise his pen.

The death of Dr. Schimper was a great blow to him, and seemed to accelerate the failure of his own health, already declining. He lost his old energy, and his sight became so impaired that the use of the microscope, and finally of books, became impossible. But to the last he felt a lively interest in what others were doing, especially in the Manchester Cryptogamic Society; he loved to recapitulate stories of old rambles, and adventures, and disputations of former days; and an excellent memory which still served him well was always ready to recall the past and portray in picturesque language the doings in which he had taken a part.

H. Boswell.

PLANTS FOUND NEAR KILMANOCK, CO. WEXFORD.

By G. Barrett-Hamilton and L. S. Glascott.

During the past year (1889) we have continued our botanical excursions into the counties surrounding Kilmanock and Alderton. The extent of country covered by these expeditions has been much larger than in the years 1887 and 1888, extending from Inch in the north to Carnsore in the south of Wexford, and including also a portion of Kilkenny and Waterford. The results have, however, been much less than before, especially as the weather has been very unfavourable for botanical expeditions. Nevertheless, a few additions to the districts of the 'Cybele Hibernica' will be found in the following list. When a plant is new to a district an asterisk is prefixed. We have again to offer our hearty thanks to Mr. A. G. More for the great assistance which he has rendered us, and also to Mr. C. B. Moffat, of Ballyhyland, Co. Wexford.

In the County of Wexford, District 4: —

Lepidium Smithii Hook. About Chapel Station.

‡*Reseda lutea* L. One fine plant in the middle of a field on Fisherstown Hill, near Alderton.

Viola Curtisii Forst. Rosslare and Duncannon; plentiful.

Lychnis vespertina Sibth. About Fethard and Carne.

Malva moschata L. At Inch and Camolin Stations. — †*M. rotundifolia* L. Near the extreme end of Carnsore Point.

Trifolium fragiferum L. Near "The Pill,"* Alderton.

Hippuris vulgaris L. This plant seems rare in the county. The only localities at present known for it are—(1.) At Kilmanock, in two different places; (2.) In the Pill of Rathdooney, Rosslare.

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* The term "Pill" is locally applied to the brackish creeks through which small streams discharge themselves into the estuary.

‡*Galium Mollugo* L. In two fields near Alderton very sparingly, and probably introduced.

Dipsacus sylvestris L. By the roadside between Wellington Bridge and Rosegarland.

‡*Cichorium Intybus* L. This plant occurs in many fields in the neighbourhood of Kilmanock. It is probably not native in any of its localities.

‡*Cuscuta Trifolii* Bab. Abundant in one field near Alderton, overlooking the River Barrow. Although growing on every kind of plant of trefoil, vetch and knapweed, it showed a decided preference for thistles, upon which it especially flourished. The field had not been disturbed for years.

Lycopsis arvensis L. On the sands at Fethard.

Echium vulgare L. Two or three plants grow by the railway, a little east of Bree Hill.

Orobanche Rapum Thuill. In two localities by the roadside between New Ross and Kilmanock.—‡*O. minor* L. Near Chapel.

Lamium incisum Willd. A considerable patch of this plant grows on and at the foot of the road-fence near Dunmair Bog.

‡*Anagallis arvensis* L., var. *cærulea*. A very fine plant was found last year, in the garden at Kilmanock.

Beta maritima L. Fethard. Also on the embankment at Kilmanock, about ten miles from the open sea.

Rumex Hydrolapathum Huds. The locality given for this plant last year (Journ. Bot. 1889, p. 6), was accidentally printed "Lickerstown." It should be Fisherstown.

Euphorbia portlandica L. The locality given last year (Journ. Bot. 1889, p. 6), was a mistake. The plant has, however, since been found on the embankment at Kilmanock.

Callitriche hamulata Kutz. In the Augnaglaur River, near Chapel.

‡*Anacharis Alsinastrum* Bab. Plentiful in one of "the Island" drains at Kilmanock.

Allium vineale L. By the pond and on the embankment at Kilmanock.

Lemna trisulca L. In the old flaxpools at Kilmanock. Also plentiful in the Pill of Rathdooney at Rosslare.

Carex vulpina L. By the roadside near Rosslare.

Glyceria aquatica Sm. Plentiful in some of the large drains near New Ross.

In the County of Waterford, District 2:—

Cochlearia danica L. Dunmore East.

‡*Ægopodium Podagraria* L. In the garden at Ballydavid.

‡*Galium Mollugo* L. By the avenue at Blenheim.

Lemna trisulca L. Kilbarry Bog, near Waterford. — *L. gibba.* Plentiful in Kilbarry Bog.

Carex riparia Curt. Kilbarry Bog.

In the County of Kilkenny, District 3:—

**Cochlearia anglica* L. A few plants in the marsh by the mill at Snowhill.

**Crithmum maritimum* L. On the rocks by the river Suir at Snowhill.

Scrophularia aquatica L. By a stream near Snowhill.

**Mentha rotundifolia* L. Roadside near Snowhill.

Samolus Valerandi L. Snowhill.

Armeria maritima Willd. Plentiful by the Suir near its junction with the Barrow.

**Juncus maritimus* Sm. Plentiful by the Suir at Snowhill.

Scirpus Savii S. et M. Snowhill.

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.

By James Britten, F.L.S., and G. S. Boulger, F.L.S.

(Continued from p. 56.)

Noehden, George Henry (1770–1826): b. Gottingen, 23rd Jan. 1770; d. London, 14th March, 1826. LL.D., 1796. F.L.S., 1800. Vice-Secretary, Hort. Soc. Librarian, Brit. Mus., 1820. Contrib. to Eng. Bot. 738, 858. 'Varieties of Citrus,' Trans. Hort. Soc. iii. Appx. R. S. C. iv. 631; Rose; Hoefer.

Noel, Lady Elizabeth (1731–1801): b. London ?, 1731; d. Bath, 1801; bur. Exton, Rutland, 10th Dec. 1801. Eldest sister of the following. Contributed to Withering's 'Arrangement' (ed. 3, i. ix., iv. 145). MS. Flora of Rutland in possession of Col. E. A. Noel at Duffield.

Noel, Henry, 6th Earl of Gainsborough (1743–1798): b. Exton, Rutland, 19th April, 1743; d. 8th April, 1798; bur. at Exton. Hon. Memb. L.S., 1788. Succeeded to Earldom, 1759. Herbarium in possession of Lord Gainsborough at Exton. Contrib. to Eng. Bot. (50, 1188). Portraits in possession of the family, at Exton and Duffield.

Norris, Sir William (fl. 1849). Recorder at Penang. Sent plants from Mount Ophir to Gardner. Journ. Bot. 1849, 328. *Norrisia* Gardn.

North, Frederick, 5th Earl of Guildford (c. 1766–1827): b. c. 1766; d. 14th Oct. 1827. D.C.L., Oxon, 1793. LL.D,, Camb., 1821. F.R.S., 1794. M.P., Banbury, 1792. Sec. of State, Corsica, 1795. Governor of Ceylon, 1798–1805. Sent Ceylon plants to Banks.

North, Richard (fl. 1759). Nurseryman, of Lambeth. 'Treatise on Grasses' and 'Gardeners' Catalogue,' 1759. Johnson, Hist. Gard. 215; Pritz. ed. i. 213.

Notcutt, William Lowndes (d. before 1871). Lived at Daventry, Fareham, and Cheltenham. Grandson of the following. 'Handbook Brit. Plants,' 1865. Contrib. to Phyt. i. and ii. on Daventry, Fareham, and Ipswich plants. Jacks. 237; R. S. C. iv. 646; Top. Bot. 552.

Notcutt, William Russel (d. before 1802): d. Surinam, before

1802. Of Ipswich. F.L.S., 1796. Lectured on Chemistry, New College, Hackney, 1796. Eng. Bot. 1049.

Nowell, John (1802?–1867): b. 1802?; d. Todmorden, Yorksh., 28th Oct. 1867. Of Todmorden. Twister-in. Muscologist. Discovered *Cinclidium stygium* in 1836, Eng. Bot. 2840. Contrib. to Baines' 'Fl. Yorksh.' (1840), and wrote 'Mosses' in Suppl. to same (1854). Windsor, 'Fl. Cravoniensis,' vii. Buxton, Bot. Guide, x., xiv. Correspondent of Wilson: letters in Wilson Corresp., Bot. Dept., Brit. Mus. Jacks. 262; Cash, 102.

Nuttall, John (d. 1849–50). Of Tithewer, Co. Wicklow. Arboriculturist. Knew Irish plants well. Journ. Bot. 1850, 94.

Nuttall, Thomas (1786–1859): b. Long Preston, Settle, Yorksh., 5th Jan. 1786; d. St. Helen's, Lanc., 10th Sept. 1859. Printer. F.L.S., 1813. Emigrated to Philadelphia, 1807; Upper Missouri, 1811; Arkansas, 1818; Snake River, 1834; Sandwich Isles and Monterey, 1836. Prof. Bot., Harvard, 1834. Returned to England, 1842. 'Genera of N. American Pl.,' 1818. Study-set bought by Brit. Mus.: sets also at Kew, Harvard, and Philadelphia. Pritz. 235; Jacks. 587; R. S. C. iv. 650; Whittle, 'Blackburn as it is,' 1853, 194; Cott. Gard. xxiii. 7, 349; Proc. Linn. Soc. 1860, xxvi.; Journ. Bot. 1841, 108. *Nuttallia* Torr. & Gray.

Ogilby, Alan (fl. 1471). Of Scotland. Resided in Constantinople and Venice. 'De virtutibus herbarum,' in 6 books. Pult. ii. 2; Haller, i. 245; Tanner, 560.

Ogilby, Leslie (fl. 1845). Of Dublin. Connemara Plants, Phyt. ii. 345. Contributed to 'Irish Flora,' pref. p. x. R. S. C. iv. 63.

Ogilvie, George (fl. 1780). Collected in Guinea. Pl. in Herb. Mus. Brit.

Ogilvie-Forbes, George (*olim* **Ogilvie**) (1820–1886): b. Aberdeen, 1820; d. Boyndie, near Banff, 25th June, 1886. A.M., Aberdeen, 1839. M.D., Edinb., 1842. F.B.S.Ed. Lect. Physiology, Univ. Aberdeen, 1860–77. 'Genetic Cycle,' 1861. 'Nature of Ferns,' One of founders of Scottish Cryptogamic Soc. R. S. C. iv. 664; Scott. Nat. 1887, 1.

Oglander, John (1778?–1825): b. Brading, I. of Wight?, 1778; d. Oxford, 30th Oct. 1825; bur. Merton College, Oxford. Muscologist. M.A., Oxon, 1804. Sub-warden of Merton Coll., 1824. Contributed Mosses to Purton's Midland Flora, Appendix, 95, &c.

Oldfield, Augustus (fl. 1863). "A zealous collector, and a careful and acute observer," Fl. Tasm. cxxvii. Fl. Austral. i. 14*. *Lasiopetalum Oldfieldii* F. v. M.

Oldham, Richard (1837–1864): b. 1837; d. and bur. Amoy, 13th Nov. 1864. Botanical collector in Eastern Asia. Plants at Kew, Brit. Mus., &c. Journ. Linn. Soc. ix. 163; Journ. Bot. 1866, 239. *Desmodium Oldhami* Oliv.

Oldham, Thomas (1816–1878): b. Dublin, May, 1816; d. Rugby, 20th July, 1878. M.D. F.G.S., 1843. F.R.S., 1848. On Geological Survey, Ireland, 1839; Director, 1846. Prof. Geol.

Univ., Dublin, 1845. Pres. Geol. Soc. Ireland, 1848. Director, Indian Geol. Survey, 1850–1876. 'Fossil Flora of Rajmahal Series' (with J. Morris). R. S. C. iv. 672; viii. 528; Proc. Geol. Soc. 1878–9, 46; Jacks. 190. *Oldhamia* Forbes.

O'Meara, Rev. Eugene (c. 1815–1880): b. circ. 1815; d. Newcastle Lyons, Co. Dublin, 20th Jan. 1880. M.A., Dublin, 1858. A founder of Dublin Microscopical Club. Diatomist. Journ. Bot. 1880, 128; R. S. C. iv. 684; viii. 530.

Ondaatje, William Charles (d. 1888): d. Eastbourne, Oct. 1888. Surgeon. Of Colombo, Ceylon. F.L.S., 1882. R. S. C. viii. 531.

Ordoyno, Thomas (fl. 1807). Nurseryman. Of Newark. 'Flora Nottinghamiensis,' 1807. Pritz. 237; Jacks. 258.

Oudney, Walter (1790–1824): b. near Edinburgh, Dec. 1790; d. Murmur, W. Soudan, Africa, 12th Jan. 1824. M.D., Edinb., 1817. African traveller. Naval surgeon. Practised in Edinburgh. In N.W. Africa, 1821–1824. Denham and Clapperton, 'Narrative of Travels,' 1828. Plants in Brit. Mus. Journ. Linn. Soc. xvii. 328; Jacks. 346; Memoir by Rev. T. Nelson, 1830. *Oudneya* Br.

Oxley, Thomas (fl. 1847–1858). Of Singapore. Entomologist. 'Botany of Singapore,' Journ. Ind. Archipel. iv. 1850, 436. Journ. Bot. 1857, 1; R. S. C. iv. 730.

Page, William Bridgewater (fl. 1817). Nurseryman. Of Southampton. 'Prodromus of Pl. in Southampton Bot. Gard.,' 1817. Pritz. 239; Jacks. 415.

Paley, Frederick Apthorp (1816–1888): b. Easingwold, Yorksh., 1816; d. Bournemouth, 11th Dec. 1888; bur. Cambridge. Classical scholar. B.A., Camb., 1838. M.A., 1842. LL.D., Aberdeen, 1883. 'Wheat ears,' 1859. 'Wild Flowering Pl. of Peterborough,' 1860. 'Wild Flowers of Dover.' 'Fl. Pl. of Barnes Common,' 1882. Jacks. 589; 'Athenæum,' 1886, 813.

Palgrave, Thomas (c. 1805–c. 1869): b. Norfolk, circ. 1805; d. circ. 1869. Solicitor, of Liverpool. Cousin of Sir W. Hooker. Muscologist, as a schoolboy in 1818, and in late life. Correspondent of Wilson. Letters (1856–1869) in Wilson's Correspondence in Herb. Mus. Brit.

Palmer, Rev. S. (fl. 1829). Of Chigwell, Essex. Contributed to Mag. Nat. Hist. 1829, 212.

(To be continued.)

SHORT NOTES.

A Potamogeton Note.—In this Journal for 1889 (p. 377), Mr. G. C. Druce records, on the faith of a specimen in Herb. Sherard at Oxford, that the "Potamogiton folio angusto pellucide fere gramineo" of the 3rd ed. of Ray's 'Synopsis,' is a state of *P. crispus* L. In the Linnean Herbarium is a specimen so named, with a pencil note by Sir. J. E. Smith, "Fl. Brit. 86. 10. *gramineus* Linn.? Not an original specimen." This specimen is, as Hartmann correctly determined, *P. Friesii* Rup. = *P. pusillus major* Fries = *P. mucronatus* Auct. Yet Smith has it under *lucens*, with a query, in one book; and under *heterophyllus*, with a query, in another! Here is an example of how utterly untrustworthy these names are without specimens. Smith's own herbarium gives no help or clue to any of these plants.—ARTHUR BENNETT.

POTAMOGETON TUCKERMANI Robbins (1868). — As our American friends are much exercised respecting the earliest names their plants ought to bear, it may be well to record that this species is the *P. confervoides* of Reichenbach's 'Icones,' vol. 7, according to Gay's herbarium at Kew. As Reichenbach describes it, I suppose it must bear his name, which is certainly more appropriate than most names are.—ARTHUR BENNETT.

PRINGSHEIMIA Rke.—The fact is not mentioned in the review of Reinke's 'Atlas Deutscher Meeresalgen' in your last number, and appears to have escaped the notice of other algologists, that the name *Pringsheimia* has already been appropriated by H. C. Wood ('Contribution to the History of the Freshwater Algæ of North America,' p. 195), for a genus of Œdogoniacæ. If, therefore, Reinke's genus is to be retained, some other name must be found for it.—ALFRED W. BENNETT.

NOTICES OF BOOKS.

The Flora of Suffolk; a Topographical Enumeration of the Plants of the County, showing the Results of former Observations and of the most recent Researches. By W. M. HIND, LL.D. London: Gurney & Jackson. 8vo, pp. xxxiv. 508; map.

An Account of the Flowering Plants, Ferns and Allies of Harleston [*Norfolk*]. Compiled and edited by the Rev. FRANCIS WILLIAM GALPIN, M.A., F.L.S. London: Bartlett & Co. 8vo, pp. 157.

THE second of these volumes was prepared for the members of the Harleston Botanical Club, to whom it is dedicated. It contains certain features, such as "Hints to Collectors" and notes on books dealing with British botany in general, which are not usual in local floras, but which are likely to be useful to those for whom it is specially intended. The introduction deals with local features, climatic, geological and botanical. The enumeration of plants makes no pretence to be critical, but gives an impression of care and of accuracy in small matters; while the clean typography and careful printing prepossess one in favour of the book. The "abbreviations" employed to denote contributors and records are needlessly puzzling. "WA," for example, stands for 'Withering's Arrangement'; "DC," for 'A Catalogue of Plants found in Dickleburgh'! and so on. The nomenclature has been to a great extent brought up to date. A large portion of the six (not eight, as stated by Dr. Hind) mile radius from Harleston, to the investigation of which the Botanical Club devotes itself, is in Suffolk;

hence notice of Mr. Galpin's book in connection with Dr. Hind's more ambitious 'Flora.'

Of Dr. Hind's book, the very opposite must be said, so far as printing and general get-up are concerned. It is desirable to enter a protest as to the cumbrousness which is becoming too frequent in local floras, and which is as unnecessary as it is objectionable. The local printer has hardly been well advised in binding his advertisement into the volume, although he is less to blame than those who supervised the work. The type employed for the names of orders and genera is ridiculously large, and the arrangement by which (as on p. 365 and elsewhere) the name of an order, a genus or a species of plant appears by itself on the last line, the remainder of the information following overleaf. The volume is further disfigured by printer's "ornaments" of the crudest kind, and weighs 2 lbs. 6 oz.—no trifling drawback to its use in the field on a summer's day!

The Flora proper, although it can hardly take a place in the first rank, is nevertheless a valuable addition to our list of such works, and bears evidence of careful compilation, although it somewhat lacks in that personal and intimate knowledge of the plants enumerated which renders Mr. Archer Briggs's Flora of Plymouth so valuable and interesting. Prof. Babington and Mr. Baker have afforded "very special assistance" with the Rubi and Roses; and Mr. Arthur Bennett has helped in "many ways," though we are not told that the Potamogetons have been named by him. Dr. Churchill Babington and the Rev. E. Skepper left material of which Dr. Hind, with due acknowledgment, has made good use. Suffolk, indeed, as appears from the interesting chapter on "The Progress of Botanical Study" in the county, has received its full share of attention. Turner, Gerard, Parkinson, Ray, Buddle and Smith, all record plants for the county; while such local botanists as the Cullums, Pitchford, Dawson Turner, Lilly Wigg, Henslow, and the Pagets have contributed to make its flora better known. F. K. Eagle is hardly correctly described (p. 487), as "of the beginning of the present century," as he did not die until 1856; and "the genus *Cullumia-Lisianthus*" (p. 478) is a curious misprint. The number of herbaria of Suffolk plants in existence is noteworthy, and Dr. Hind has made good use of them.

An interesting feature of the book is the "Palæontological Botany of Suffolk," based on the researches of Mr. Clement Reid in the Cromer Forest bed; the comparison of the Suffolk Flora with that of Holland is useful, although it might have been more complete. It is to be regretted that Dr. Hind has taken upon himself to alter certain names, as in substituting *Epithymus* for *Epithymum*, "as the latter is incorrect in form." And it would have been well to have given the local English names in actual use, and to have omitted such monstrosities as "Boehmer's Phleum" and "Puell's (*sic*) Vernal Grass" (p. 387). The districts into which the Flora is divided are the recognised parliamentary divisions of the county, and are thus of no value whatever for botanical purposes.

Dr. Hind tells us that his Flora is "not to be regarded as a complete and exhaustive work; it is only a step onward." We hope that the new Flora when it comes may combine the painstaking ability of the present author with a greater regard for portability and for typographical details than is manifested by the present volume.

We wish to call the attention of our readers to the 'Illustrated Monograph of British Hieracia,' by Mr. F. J. Hanbury, of which two parts have already been issued. A critical notice is deferred until the work has made further progress; meanwhile, we cannot refrain from expressing our admiration of the plates, which take rank among the most beautiful productions of the kind. Three are issued with each number; and although the cost of the work, —6s. each part,—is somewhat high, it is easy to understand that such figures cannot be produced save at very considerable outlay. The work is issued quarterly, and may be obtained from the author, Plough Court, 37, Lombard Street, E.C.

New Books. — Asa Gray, Sereno Watson, and J. M. Coulter, 'Manual of the Botany of the Northern United States' (New York, Ivison: 8vo, pp. 760, 25 plates).—J. R. A. Davis, 'The Flowering Plant,' (London, Griffin: 8vo, pp, 181: 60 figs. 3s. 6d.). —J. G. Boerlage, 'Handleiding der Flora van Nederlandsch Indië' (pt. i. *Ranunculaceæ—Moringaceæ*, Leiden: Britt.: 8vo, pp. 312, index).—J. Haak, 'Observations sur les Rafflesias' (Amsterdam, Scheltena: 4to, pp. 8, tt. 4).—A. Berlese & G. Bersadola, 'Micromycetes Tridentini' Rovereto: 8vo, pp. 103, tt. 6). — G. Schneider, 'Die Hieracien der West-Sudeten' (pt. i.—Cunnersdorf: 8vo, pp. 114).—C. von Ettingshausen, 'Das Australische Florenelement in Europa' (Graz, Leuschner: 4to, pp. 9, i. plate).

Articles in Journals.

Annals of Botany (iv. 13, dated Nov. 1889, issued Jan. 1890).—G. Massee, 'Monograph of British Gastromycetes' (4 plates).—C. A. Barber, 'Change of flowers to tubers in *Nymphæa Lotus*' (1 plate).—Anna Bateson, 'Change of shape exhibited by turgescent pith in water.' — H. W. T. Wager, 'Structure of nuclei in *Peronospora parasitica* (1 plate).—D. H. Scott, 'Recent progress in knowledge of Anatomy of Plants.' — M. T. Masters, 'Double-flowered *Ceanothus*.'— F. O. Bower, 'Pitchered insectivorous plants.' — Id., 'Aposporous development in Ferns.' — A. L. Keane, Lily and Onion disease in Bermuda. — A. W. Bennett, 'A hybrid Desmid.' Id., '*Vaucheria*-galls.'—J. B. Farmer, 'Stomata in fruit of *Iris*.'— T. Johnson, '*Mystropetalon Thomii*.'

Bot. Centralblatt. (No. 6). — J. Freyn, 'Zur Kenntniss einiger Arten der Gattung *Ranunculus*.' — (No. 6). P. Kunth, 'Blüten-Biologie und Photographie.' — J. Börnmuller, 'Zur Flora Ost-Bulgariens.' — F. R. Kjellman, 'Ueber die Beziehungen der Flora des Bering-Meeres zu der des Ochotskischen Meeres.' — (No. 7). Z. Schumann, 'Zur Anatomie des Compositenstengels.' — R. Herse, 'Zur Entwickelungsgeschichte der Hypogaeen.' — (No. 8). J. Röll, 'Ueber die Veränderlichkeit der Stengelblätter bei den Torfmoosen.'

Botaniska Notiser (Jan.). — J. M. Hulth, 'Om reservnäringsbehållare hos lafvar.' — A. G. Kellgren, 'Några växtfysiognomiska anteckningar från norra Dalsland.' — O. Juel, 'Några Mykologiska notiser.' — R. Sernander, 'Om förekomstem af subfossila stubbar på svenska insjöurs botten.'—T. Hedlund, *Ranunculus paucistamineus.* A. Berg, 'Kritik öfver några växtformer.' — N. Wille, 'Yderligere om regnopfangende Planter.'

Bot. Gazette (Jan.). — D. H. Campbell, 'Affinities of *Filicineæ.*' A. L. Keane, 'Lily Disease in Bermuda' (1 plate). —J. M. Coulter & J. N. Rose, *Donnellsmithia* (gen. nov. Umbellif.) *guatemalensis* (1 plate). Memoir of Leo Lesquereux (Nov. 18, 1805—1889). —K. E. Wilson, 'Double Flowers of *Epigæa.*'

Bot. Zeitung (No. 5). — E. Zacharias, 'Ueber die Zellen der Cyanophyceen.'—(Nos. 6–8). J. Behrens, 'Zur Kenntniss einiger Wachsthums-und Gestaltungsvorgänge in der vegetabilischen Zelle.' —H. Hoffmann, 'Ueber phaenologische Accomodation.'

Bull. Soc. Bot. Belge (xxviii. 2: Feb. 7). — F. Renauld & J. Cardot, 'Mousses Nouvelles de l'Amerique du Nord' (3 plates). — M. T. Masters, 'Morphology of *Rosa berberifolia.*' — F. Crépin, 'Les excursions rhodologiques dans les Alpes en 1889.' — E. Laurent, 'L'existence des microbes dans les tissues des plantes supérieures.' — T. Durand, 'Les acquisitions de la Flore Belge, 1887–9.' — E. Marchal, '*Bommerella trigonospora*' (1 plate). — (Comptes-rendus). E. De Wildeman, 'Flore algologique du Congo.' — F. Crépin, '*Rosa gigantea.*' — F. Pietquin, 'Fleur anomale de *Narcissus Pseudo-narcissus.*' — F. Crépin, 'Roses américaines.'— E. De Wildeman, '*Hansgirgia flabelligera.*'—A. De Wevre, 'Sur le Péricycle.' — F. Crépin, '*Rosa moschata* en Arabie.' — Id., *Rosa Colletti*, n. sp.—E. Marchal, *Didymopanax falcatum* & *D. acuminatum*, spp. nn. — Maria Goetsbloets, '*Ledum palustre.*' — F. Crépin, 'Floraison et maturation dans le genre *Rosa.*' — Id., 'L'odeur des glandes dans le genre *Rosa.*' — E. De Wildeman, '*Trentepohlia.*'— V. Mouton, 'Ascomycétes nouveaux ou peu connus.' — F. Crépin, 'Développement du Pollen dans *Rosa.*'—A. De Wevre, 'Mucédinées de la Flore de Belgique.' — E. De Wildeman, '*Phycopeltis.*' — G. Lochenies, '*Schœnus ferrugineus.*' — E. Laurent, 'Influence de la lumière sur les spores du charbon des céréales.'—H. Christ, '*Carex.*'

Bull. Soc. Bot. France (xxxvi.: Comptes rendus 7: Feb. 1).— E. G. Camus, 'Quelques faits nouveaux sur la Flore des environs de Paris.'— J. A. Battandier, 'Un nouveau *Lactuca* d'Algérie' (*L. numidica*).—L. Trabut, 'Notes agrostologiques' (*Stipa Letourneuxii*, *Avena Letourneuxii*, spp. nn.: 1 plate).—M. Brandza, 'Anatomie & développement des téguments de la graine chez les Géraniacées, Lythrariées, & Œnothérees.' — W. Russell, 'Organisation des verticilles foliaires des Spergules.' — G. Rouy, *Centaurea mirabilis* (*C. calcitrapa* × *C. pullata*). — E. Prillieux, '*Pachyma Cocos* en France.'

Bull. Torrey Bot. Club (Jan.). — F. V. Coville, U. S. species of *Fuirena*. — N. L. Britton, Rusby's S. American Plants (*Inga boliviana*, *Licania pallida*, *Hirtella Burchellii*, *Rubus Rusbyi*, spp. nn.). E. L. Greene, 'Bibliographical Notes.' — *Rhexia aristosa* Britton (1 plate).— (Feb.). J. I. & A. B. Northrop, 'Plant Notes from Tadousac, Canada.' — E. L. Rand, 'Notes on Flora of Rangeley Lakes.' — T. D. A. Cockerell, 'Castilleia.' — T. C. Porter, *Aster Torreyi*, n. sp. (1 plate).

Gardeners' Chronicle (Feb. 8). — *Cypripedium siamense* N. E. Br., n. sp. — (Feb. 15). *Colchicum procurvens* Baker, n. sp. — 'Garden Flowers of the Tudor Period.' — (Feb. 22). *Trichopilia punctata* Rolfe, n. sp.—W. G. Smith, 'Action of Light on Plants' (fig. 37).

Journal de Botanique (Jan. 1).—G. Camus, 'Orchidées hybrides.' —L. Guignard, 'Sur la localisation dans les Amandes et le Laurier-cerise des principes qui fournissent l'acide cyanhydrique.' — N. Patouillard, 'Contributions à la flore mycologique du Tonkin.'

Journ. R. Microscopical Soc. (Feb.) — A. W. Bennett, 'Freshwater Algæ and Schizophyceæ of Hampshire and Devonshire' (*Schizothrix anglica*, *Rhizoclonium geminatum*, spp. nn.).

Oesterr. Bot. Zeitschrift (Feb.). — E. v. Halácsy, 'Beiträge zur Flora der Balkanhalbinsel.' — J. v. Szyszylowicz, *Weinmannia Karsteniana* & *W. Mariquitæ*, spp. nn. — J. Freyn, 'Plantæ Karoanæ.' —A. Hansgirg, 'Phytodynamische Untersuchungen.' — K. Bauer, 'Untersuchungen über gerbstoffführende Pflanzen.' — P. Magnus, 'Moritz Winkler' (Feb. 13, 1812—Dec. 21, 1889).—E. Formánek, 'Zweiter Beitrag zur Flora von Bosnien.'

LINNEAN SOCIETY OF LONDON.

February 6th, 1890.—Mr. Carruthers, F.R.S., President, in the chair.—Mr. T. W. Kirk was elected a Fellow of the Society.—Prof. Stewart made some remarks on the "pitchers" of *Nepenthes Mastersiana*, upon which criticism was offered by Mr. Thomas Christy, Prof. Howes, and Mr. G. Murray.—Mr. G. S. Boulger exhibited a series of original water-colour drawings of animals and plants of the Falkland Islands.—Mr. W. H. Beeby exhibited some forms new to Britain of plants from Shetland.—Mr. C. B. Clarke, F.R.S., then read a paper on the stamens and setæ of *Scirpeæ*, illustrated by diagrams, which elicited a detailed criticism from Mr. J. G. Baker, to which Mr. Clarke replied.—A paper was then read by Mr. B. D. Jackson, which had been communicated by the late Mr. John Ball, on the Flora of Patagonia, prefaced by some remarks by the President on the loss which the Society had sustained through his recent death.

NOTES ON ENGLISH RUBI.

By W. O. Focke, M.D.

Considering the great number of European Rubi hitherto described, our knowledge of the genus ought to be very complete. There will be, however, little doubt about the fact that exactly the contrary is the case. Specimens that cannot be named by the best authorities are of frequent occurrence. In the year 1857, when I began the study of brambles, we possessed, besides forty or fifty synonyms and incomplete sketches, less than a hundred descriptions of European Rubi deserving regard. Since that time botanists have done much work in the genus, and the mean annual production of new species may have amounted to fifty or sixty, or more. In this way the industry of botanical writers has given us more than 2000 names of European brambles. Perhaps the variety of these plants may be great enough for establishing such an astonishing number of different kinds—I dare not say species, a term which would be not quite adequate, even in its Jordanian meaning. If, however, considering the manifoldness of Nature, the facts would involve perhaps no serious objection to the real existence of much more than a thousand so-called species, there can be no doubt that the limited capacities of the human mind would not permit a clear distinction of such a multitude of closely-allied forms. A student of our brambles will be able to catch, during the first summer, the distinctive marks of about twenty species. After some years he may become acquainted with 60, or 100, or even more European brambles; but then it will be very difficult, if not quite impossible, for him to distinguish every year twenty new forms more, and to keep them separate from all the other species he already knows. But if we admit he would be able to do this, it must be nevertheless a hopeless attempt to follow the rapid progress of the pretended science describing year after year about sixty new species.

It is a general rule in science that every one who proposes a new species must distinguish it from all related forms hitherto known. At present, in the case of the European Rubi, the most accomplished erudition cannot comprehend more than perhaps a third or fourth part of all described "species." The most ignorant beginner therefore may fancy that no great difference exists between him who knows scarcely more than nothing, and the best authorities, who know not very much. Why should he not give new names, as many others have done before him?

The practice of fabricating the mentioned abundance of new names has been a continental folly. For a long time really scientific men like Prof. Babington and Mr. J. G. Baker have been the leading English rubologists, and their authority has been great enough to prevent all attempts at following the example of P. J. Mueller, Gandoger, and others.

Every one who has been occupied in the study of Rubi knows very well that neither the perusal of descriptions nor the comparison of a few dried branches can lead to a real acquaintance with a difficult bramble. It would be more instructive to examine the living plant, but nobody can visit all localities where doubtful species are growing.

It would be tedious to enumerate all the various difficulties which we cannot escape in these researches. The question arises—are we obliged to waste our time in studying the foolish writings of every ignorant and mischievous manufacturer of names? A neglect of such productions has nothing to do with the esteem we pay to the work of our true predecessors in science.

Several botanists have thought that knowledge would profit more from a diminution of the numerous species than from an increase. Therefore they combined a great number of different forms, producing in this manner an aggregate species. The easiest way to escape all difficulties would be to establish a *Rubus polymorphus*, as Spenner did. In following his example we either obstruct scientific research, or, if we admit subspecies and varieties, we change the terms only. At present we are accustomed to say *Rubus suberectus*, *R. plicatus*, &c., but it is a matter of mere convenience if we should prefer to alter this nomenclature into *R. fruticosus* subsp. *suberectus* and subsp. *plicatus*. Science would neither be improved nor damaged by this arrangement. In other groups of our brambles the question is much more intricate. Certainly the limits of the separate forms are often very difficult to trace; but between the aggregate species, comprehending all connecting links, exist no limits at all.

My own opinion is that in such genera as *Rubus*, *Rosa*, *Hieracium*, and many others, hybridization once has mixed the old species, with the effect of producing, in the course of many hundred years, numerous new species of a lower order. At present we see exactly the same occur in the Rhododendrons, Fuchsias, Begonias, Abutilons, and many other favourite plants of our gardens. In all the second-rank species, originated in the woods or in cultivation, the pollen contains a considerable number of imperfect grains. There are only three English blackberries which have quite regular pollen-grains, viz., *R. cæsius*, *R. rusticanus*, and *R. gratus*.

These views do not necessarily lead to the conclusion that at present there must take place abundant intercrossing between all our existing brambles. *R. cæsius*, *R. vestitus* (*leucostachys*), and *R. rusticanus* (on the Continent *R. tomentosus* and *R. rudis* too) are very much inclined to produce hybrids as well *inter se* as with many other species. Everywhere we observe associated with them a good many perplexing intermediate forms and connecting links resisting all attempts at classification. We must not fancy that hybrids are always rare. On the Continent the *R. cæsius* × *Idæus*, a hybrid which I have produced artificially, is in many districts a common plant, although it very seldom bears a single fruit, and is usually altogether sterile. Frequent hybridization, however, is not a general rule among our brambles. On the contrary, hybrid brambles, which are not procreated by one of the few species named above, are of rather rare occurrence.

The only way which can lead to a better knowledge of our indigenous Rubi is the study of the constant species retaining the same appearance under different circumstances and in different countries. The first rule must be not to name every single bush and every local form. What we want is a clear idea of the leading species, and a positive nomenclature which will be generally understood.

Last summer (1889) I visited some parts of Southern England. I spent several days at Plymouth, where I was favoured with the kind guidance of Mr. Archer Briggs, who accompanied me to Bournemouth. Here I enjoyed during a repeated sojourn the hospitality and the valuable instructions of the Rev. W. Moyle Rogers. I am very much indebted to my English friends who have introduced me to the study of the living British Rubi.

I do not intend to give complete descriptions of the Rubi I have seen, because my English friends know them much better than I do. Moreover, I put aside all discussions about local and doubtful forms, although I suppose several brambles, which I so far know from a limited locality only, will prove to be frequent in other places or other countries. My only purpose is to compare the British Rubi with the continental species. Having seen a good deal of the English brambles at their natural stations, I can rely upon an accurate knowledge of the discussed plants. I shall name the localities where I observed them in a living state. Several other English species, which I have seen in dried specimens only, may be mentioned in case I am quite sure about the determination.

A general remark will be of some interest. Many species of Rubi develop much more compound and more conspicuous inflorescences near the eastern and northern limits than in the centre of their area of distribution. The reason of this occurrence will be easily understood. In a rough climate the barren stems of our brambles freeze down until near the ground. The short remaining part produces only a few, but very compound and showy, flowering branches. Such forms have often been considered to be specifically distinct.

Enumeration of some Species.

I. *Stems glabrous, suberect, or growing in a high arch, rarely rooting at the end. No glandular setæ.*

1. R. suberectus G. Anders.—Seen near Buckland, Lymington, S. Hants; Bickleigh Vale, S. Devon.

Continental distribution. W. Russia, S. Sweden (northward to 60°), and Norway (northward to 62° 45′); the whole of Central Europe.

2. R. fissus Lindl.—The true species is a bramble with many "cleft" (=*fissus*) or septenate leaves. All parts of it, with the exception of the prickles only, are smaller than in *R. suberectus*; the leaflets are often plicate, the stamens do not exceed the styles, and the mature fruits are purplish. The stem is armed with frequent straight slender prickles, not confined to the angles, very different from the short ones seen in *R. suberectus*. It is a decidedly

northern form. I possess a dried cultivated specimen from the Cambridge Garden, and I have seen dried specimens from Scotland, and the northern and middle parts of England.

Cont. distrib. Scandinavia, N. Germany.

3. R. SULCATUS Vest. — In general appearance this species resembles very much the *R. suberectus*, but it may be easily distinguished by its strong prickles confined to the angles of the stem, by the short but distinct foot-stalks of its basal leaflets, and by its large black fruits. It is a taller plant than *R. suberectus*, the stems are more angular, and their leaves always quinate; the flowering branches and racemes are much longer than in the allied species. The only dried English specimen I have seen was collected by Mr. Archer Briggs, "By Holsworthy and Thornbury Road, N. Devon, 13th July, 1885."

Cont. distrib. S. Sweden, Denmark, Germany, Austria, Switzerland, N. Italy, E. (and W.?) France.

4. R. PLICATUS W. et N. — A northern plant, which I have not met with on my excursions in the southern counties. I have seen a dried specimen, gathered by the Rev. W. Moyle Rogers "on wet bushy ground in the Lower Bridgerule Bog, N. Devon, Aug. 1882." In the northern parts of England it is common; the plant may also be expected to occur on the high hills of the southern counties.

Cont. distrib. S. Scandinavia, Denmark, Germany, Belgium, N.E. France. In Switzerland and Tyrol it is a mountainous species.

5. R. NITIDUS W. et N.—This is a somewhat changeable species; it resembles *R. plicatus*, but keeps in all its varieties its peculiar appearance. The typical German plant has a compound panicle armed with strong hooked prickles. A white-flowering variety is the *R. hamulosus* Lefv. et Muell. (*R. nitidus albiflorus* Wh.). The typical plant grows often in brooks, or on the banks of small streams and rivulets. The strongest and most decidedly hooked prickles seem to be the product of a loamy soil. On a sandy ground the armature of the panicle is much weaker. The *R. nitidus* I have seen with Mr. Rogers and Mr. Briggs in Hants, Dorset, and Devonshire is generally taller than the German plant; its inflorescence is narrower; its prickles are less numerous and falcate (not hooked); its leaflets acuminate, not simply acute. Notwithstanding these differences, I see no clear limits between this British form, which I think the French botanists might call *R. integribasis* P. J. Muell., and the German type, which has not always the striking characters of the *hamulosus*-like forms. Much more different is Genevier's *R. nitidus*, called by me *R. holerythros*, which I believe will prove to be a distinct species or subspecies. I have seen living plants of *R. nitidus* near Sway, S. Hants; Branksome, West Moors, Daggons, and Alderholt, Dorset; Shaugh Bridge, Bickleigh Vale, and Plymbridge Road, S. Devon.

Cont. distrib. S. Sweden, Denmark, W. Germany, France.

6. R. OPACUS Focke. — This form agrees with *R. nitidus* in the stamens longer than the styles, and embracing the young fruit. The leaves are usually larger than in *R. nitidus*, and the younger

ones are somewhat greyish and felted beneath; the basal leaflets are distinctly stalked. The shape of the terminal leaflet is ovate or cordate, gradually tapering into a long point. Near Plymouth (Egg Buckland; Bickleigh, near Shaugh Bridge) Mr. Briggs showed me a bramble he supposed to be my *R. opacus*, and I think his determination will prove to be correct, though the Devon plant seen by me is in all parts smaller than the German species. Prof. Babington at one time thought it might be *R. fissus*, but the characters mentioned above will be sufficient for a clear distinction.

Cont. distrib. Denmark, N.W. Germany, N.E. France?

7. R. affinis W. et N. — The figure of this bramble in the 'Rubi Germanici' is not good, and it may have misled many students of the genus. I know the true plant from my visits to Weihe's original stations, and from comparison of his own dried specimens. The barren stems are tall, erect-arcuate, glabrous, and remarkable for their very blunt angles and strong straight prickles. The young leaves usually are white-felted beneath; the terminal leaflet is cordate-acuminate. The prickles at the base of the panicle are remarkably long and slender, the flowers rather large, the petals usually pale pink. The upper surface of the leaves in the Dorset plant is somewhat more hairy than I am accustomed to see it in German specimens. In every other respect the plants from the different countries exactly agree. I saw *R. affinis* at several spots near Bournemouth; Alum Chine, S. Hants; Canford Chine and Gore Heath, Dorset. Dried specimens from Norfolk, sent by the Rev. E. F. Linton, represent exactly the same species.

Cont. distrib. Sweden (very local); N.W. Germany (common in many districts on sandy soil). The French *R. Cariensis* Rip. et Genev. is very near.

II. *Stems glabrous or with scattered hairs, arching, often rooting at the end. Usually no glandular setæ, but they occur occasionally in the panicle of some species.*

8. R. imbricatus Hort.—Near *R. affinis*, but in all parts smaller. The barren stems are arcuate-prostrate and branching, very different from the high arching ones in *R. affinis*. The panicle is narrower than in that species. I saw *R. imbricatus* with Mr. Briggs at several places near Plymouth.

Cont. distrib. W. France. Prof. Clavand has sent me dried specimens from the neighbourhood of Bordeaux.

9. R. rhamnifolius W. et N. — It is very difficult to say what is *R. rhamnifolius*, although I know the typical plant quite well. In every country, and often in every province, the *rhamnifolius*-type has a somewhat modified appearance. In England, *R. rhamnifolius* and *R. umbrosus* generally are thought to be very different plants. A good deal of the dry branches, however, we see in the herbaria cannot be arranged with any degree of certainty under one or the other species. The most remarkable features common to all forms of the aggregate species are a very much branched stem, strong prickles, a small dentition of the leaves, an unusually long foot-

stalk, and the roundish (broadly obovate, elliptic, or orbicular) shape of the terminal leaflet. The typical *R. rhamnifolius* has angular glabrous stems, a compound panicle armed with frequent broad-based hooked prickles, and small white flowers. The upper surface of the leaves is quite glabrous; the under side is generally covered with a close white felt, which, however, disappears in deep shade. In my var. *stenoplos* the prickles of the flowering branch are slender and declining. The English *R. rhamnifolius* I saw with Mr. Rogers in several places near Bournemouth has the same armature as this var. *stenoplos*, and is distinguished by larger flowers, and a hairy upper surface of the leaflets. Unfortunately I have never seen the other continental varieties and segregate species growing at their natural stations. The French *R. dumosus* Lefvr. seems to be near many forms of the English *R. umbrosus*. What has been named *R. umbrosus* by Fries is a form of *R. Lindebergii* P. J. Muell., I believe. This species has a hairy stem, and an inflorescence which is either quite racemose or has only short branchlets. *R. Muenteri* Marss. has leaves green on both sides, and a narrow inflorescence; my *R. Maassii* is nearly the same, but it has quite glabrous stems. Many dried specimens named *R. umbrosus*, and collected in the northern parts of England, seem to be quite typical *R. Lindebergii* P. J. Muell., and others are not distinguishable from *R. Muenteri*. The *R. umbrosus* I saw with Mr. Rogers near Bournemouth has a compound panicle, and resembles *R. dumosus* Lefvr. As far as I see, there are too many connecting links between the segregate species to allow a clear distinction. I have seen the English *R. rhamnifolius* near Bournemouth (Branksome, Daggons, &c.), Bristol (Leigh Woods), and Plymouth (Egg Buckland); the *R. umbrosus* at Bournemouth, S. Hants; Branksome and Daggons, Dorset.

Cont. distrib. of the aggregate *R. rhamnifolius*. S. Sweden, Denmark, N. Germany, N. France.

10. R. CARPINIFOLIUS W. et N. — I have not met with this species on my botanical walks in England. I have seen, however, many dried English specimens as well at Kew as in several collections sent by my English friends from Surrey, Warwickshire, Staffordshire, Yorkshire, &c. They were named *R. affinis*, *rhamnifolius*, *incurvatus*, *hamosus* Genev., or *nitidus*.

Cont. distrib. N.W. Germany, Belgium?, France.

11. R. LINDLEYANUS Lees.—Seen in S. Hants (between Lymington and Sway, Milton), Dorset (Branksome, Canford Chine, West Moors, Gore Heath, Daggons), and near Plymouth. The plant is near *R. vulgaris* W. et N., but I think it can be kept distinct.

Cont. distrib. N.W. Germany (local, but in some places abundant).

12. R. ERYTHRINUS Genev.—*R.* near *Lindleianus* Archer Briggs, Fl. Plym. p. 112 (last paragraph). The plant seems to be little known in England, and I hope Mr. Briggs will give a full description of it. I have seen it with Mr. Briggs at many places around Plymouth, and with him and Mr. Rogers near Daggons,

Dorset. In N.W. Germany I know a few scattered bushes, which I supposed to be *R. argenteus* W. et N., and which resemble very much the *R. erythrinus.* I believe there is no real difference between this species and *R. argenteus.*

Cont. distrib. France, ?N.W. Germany.

13. R. ARGENTATUS P. J. Muell. *R. Winteri* P. J. Muell. in Focke Synops. Rub. Germ. p. 196. — Mr. Charles Bailey has sent me a few branches gathered by him near Lyme Regis, Dorset, which agree exactly with the German plant.

Cont. distrib. W. Germany, France.

14. R. GRATUS Focke. — Flowers and fruits very large; pollen-grains nearly all regular; sepals patent after flowering or embracing the young fruit. The Rev. E. F. Linton has sent me dry specimens of this species, collected in Surrey, Norfolk, and Derbyshire.

Cont. distrib. Denmark, N.W. Germany, Belgium.

(To be continued.)

VASCULAR CRYPTOGAMIA OF NEW GUINEA, COLLECTED BY SIR W. MACGREGOR.

By J. G. Baker, F.R.S.

Baron von Mueller has sent to Kew a complete set of the Vascular Cryptogamia collected by Sir W. Macgregor during his recent adventurous expedition to the highlands of New Guinea, and asked me to report fully upon them. The botanical results of the expedition are of great interest. For a full account of the flowering-plants obtained, reference must be made to a paper entitled "Records of Observations of Sir William MacGregor's Highland plants from New Guinea," read by Baron von Mueller, before the Royal Society of Victoria, on the 12th of September, 1889, and now published in their recently-instituted quarto Transactions. Out of 64 flowering plants gathered in the mountain-zone, at altitudes of between 8000 and 13,000 feet above sea-level, 38 species appear to be new and endemic. Two of these are new genera, *Ischnea*, allied to *Nananthea* in Compositæ, and *Decaloca* in Epacridaceæ; of the other endemic species, 17 shew a northern affinity. Amongst these are a Hypericum, a Sagina, a Rubus, a Gentian, four Vacciniums and four Rhododendrons. Eleven species, including a Phyllocladus, a Libocedrus, a Metrosideros, an Olearia, and two Vittadinias, are allied to upland Australian and New Zealand types. Fifteen species are conspecific with well-known Australian and New Zealand plants, such as *Myosotis australis*, *Libertia pulchella*, and *Astelia alpina.* There are four Bornean plants, hitherto known only from Kina-balu. Cosmopolitan temperate types are represented in the collection by *Taraxacum officinale*, *Scirpus cæspitosus*, *Aira cæspitosa*, and *Festuca ovina.* There is a Himalayan *Potentilla* (*leuconota* D. Don), which occurs also on Kina-balu, and finally, it may be worth while to add, as I have been asked about it several times, that "the Daisy" which the expedition collected was not *Bellis perennis*, but doubtless either the new Olearia, or one of the two endemic Vittadinnias.

The following is a complete enumeration of the Vascular Cryptogamia obtained during the expedition, with descriptions of the new species. I have added in brackets a general outline of the distribution of the species already known, and the numbers prefixed to the names of the novelties indicate their position according to the sequence followed in our 'Synopsis Filicum.'

Gleicheniaceæ.

Gleichenia dicarpa R. Br.—The type on Mount Knutsford, and also a variety resembling the Javan *G. vulcanica* Blume, with larger and more copious paleæ and frond covered beneath with ferruginous tomentum. (Australia, New Zealand, Malay Isles, New Caledonia).

G. flagellaris Spreng.—The type. Mount Musgrave, alt. 7000–8000 ft., and near the summit of the Owen Stanley Range. A variety with much narrower segments, resembling the Javan *G. bracteata* Blume, on Mount Knutsford. (Polynesia, Malay, and Mascaren Isles.

G. dichotoma Hook. — Mount Knutsford. (Cosmopolitan in tropical and subtropical zone).

Cyatheaceæ.

48*. Cyathea Macgregorii, F. M. Record, p. 40. — Caudex not above 2 ft. long. Frond bipinnate, rigid in texture, the largest pinnæ in our specimens being 4 inches long by an inch broad; rachises densely or thinly clothed on the upper surface with an intertangled coat of brown paleæ; young fronds clothed copiously with a similar covering and large ovate-lanceolate whitish or brown membranous scales on the rachises. Mature pinnules lanceolate, at most an inch long, $\frac{1}{6}$ in. broad. Tertiary segments round or oblong, bullate, rigid, with much recurved rigid edges, enclosing a single large central sorus, with a fragile globose indusium.—Mount Knutsford, with *Ranunculus amerophyllus* and *Decatoca Spencerii*; also Mount Victoria and near the summit of the Owen Stanley range. A most distinct and interesting novelty. The habit and bullate tertiary segments with recurved edges recall the very rare *Cheilanthes speciosissima* A. Br. (*Plecosorus mexicanus* Fèe).

50* **Cyathea Muelleri** Baker, n. sp.—Fronds ample, tripinnate, moderately firm in texture; rachis and both surfaces naked, except the midrib of the pinnules above; upper surface dark green, lower pale green. Lowest pinnæ in our specimen oblong, a foot long. Pinnules lanceolate, under an inch broad. Tertiary segments linear-oblong, $\frac{1}{8}$ in. broad, adnate to the rachis, deeply crenate, the edge not at all recurved. Veins deeply forked in the lower lobes of the segments. Sori 8–10 to the largest segments. Indusium a persistent subentire cup. —Mount Knutsford. Allied to *C. medullaris* Sw.

Hymenophyllaceæ.

15* **Hymenophyllum ooides** F. M. & Baker, n. sp. — Stipe short, thread-like, glabrous. Fronds lanceolate, 2–3-pinnate, pendulous, glabrous 6–9 in. long, at most an inch broad; rachis thread-like. Pinnæ very numerous, lanceolate, ascending, those in the centre of the frond the largest, usually simply pinnate, rarely with small pinnate pinnules. Ultimate segments obovate, obtuse, 1-nerved, emarginate, crowded, about $\frac{1}{12}$ in. long, more or less crisped and complicated. Sori small, terminal on the ultimate segments. Indusium immersed at the base in the lamina of the segments, its valves cuneate with a rounded margin.—New Guinea highlands, alt. 9200 ft. A very distinct species, allied to *H. undulatum* and *crispum*.

H. dilatatum Sw.—Mount Musgrave, Mount Knutsford, and summit of Owen Stanley range. (Polynesian and Malay isles. New Zealand).

H. tunbridgense Sm. — Summit of Owen Stanley range. (Cosmopolitan).

H. multifidum Sw.—Musgrave range, alt. 7000–8000 ft. (Polynesia, New Zealand). What is probably an exposed mountain form of the same species, with contracted fronds and a densely scaly rachis, occurs on the same mountains.

Trichomanes humile Forst.? Camp No. 1. — (Polynesia, Java, New Zealand).

T. pallidum Blume.—Mount Musgrave. (Malay and Polynesian isles. Queensland).

T. rigidum Sw.—Mount Musgrave. (Cosmopolitan, tropical and subtropical).

T. apiifolium Presl. — Mount Musgrave. (Malay and Polynesian isles. Norfolk Island).

T. trichophyllum Moore.—Mount Knutsford. (Borneo. New Caledonia).

T. maximum Blume.—Mount Knutsford and Mount Musgrave, 7000–8000 ft. (Malay and Polynesian isles, Queensland, Perak).

Polypodiaceæ.

29.* **Dicksonia** (Patania) **rhombifolia** Baker, n. sp. — Stipe and rachis slender, naked, castaneous. Frond oblong-lanceolate, bipinnate, under a foot long, green and glabrous on both surfaces. Pinnæ sessile, lanceolate, cut down to the rachis into oblong-rhomboidal pinnules $\frac{1}{4}$–$\frac{1}{3}$ in. long, $\frac{1}{6}$ in. broad, which are truncate on the lower side at the base. Veining subflabellate. Sori solitary on the upper margin of the pinnules. Indusium an entire cup of firm texture. Near summit of Owen Stanley range.

Davallia hymenophylloides Baker, Camp No. 1. — (Philippines, New Caledonia, Java, Fiji).

D. Blumeana Hook.—Mount Musgrave, 8000–9000 ft. (Philippines to Fiji).

D. vestita Blume.—Mount Knutsford and Mount Musgrave. (Ceylon, Java).

D. pinnata Car., var. *D. gracilis* Blume.—Mount Musgrave. (Malay peninsula, Malay and Polynesian isles).

24.* **Davallia** (Leucostegia) **cicutarioides** Baker, n. sp.—Frond decompound, probably deltoid, bright green on both surfaces, moderately firm, with slender glabrous polished brown rachises. Lower pinnæ ovate-lanceolate, 6–8 in. long. Ultimate segments linear, 1-nerved, at most $\frac{1}{12}$–$\frac{1}{8}$ in. long, the sterile ones acute, the fertile obtuse. Sori minute, solitary in the dilated tip of the segments. Indusium pale, suborbicular.—Mount Musgrave. Most like the Vitian *D. ferulacea* Moore.

Lindsaya lobata Poir.—Mount Musgrave. (India to Queensland and Polynesia).

24.* **Lindsaya tricrenata** Baker, n. sp, — Stipe and rachises slender, naked, castaneous, the former 4–5 in. long. Frond glabrous, bipinnate, deltoid, moderately firm in texture, composed of few long pinnæ, attaining 6–8 in. in length, $\frac{1}{3}$ in. in breadth. Segments sessile, cuneate, $\frac{1}{6}$ in. broad, crenate on the outer edge. Veins about 3 to a segment, each one forked. Sori round or oblong, placed at the tip of the lobes. Valves of the indusium narrow, firm, glabrous.—Mount Musgrave. Allied to *L. rigida* and *borneensis.*

Lomaria procera Spreng. — Mount Knutsford and near the summit of Owen Stanley range. (Widely spread in both hemispheres).

Asplenium tenerum Forst.—Mount Knutsford. (Ceylon, Malaya, Polynesia).

A. laserpitiifolium Lam.—Mount Musgrave, Mount Knutsford, and near the summit of the Owen Stanley range. (India and China to Queensland and Polynesia).

A. Lobbianum Hook.—Mount Musgrave. (Philippines, Java).

A. latifolium Don. ?—Mount Musgrave. Rachises black. Very likely a distinct species, but material too imperfect. (India, N. Australia, &c.).

Aspidium aculeatum Sw. — Mount Knutsford and near summit of Owen Stanley range. (One of the most widely spread of the characteristically temperate types).

49.* **Nephrodium** (Lastrea) **simulans** Baker, n. sp. — Rootstock not seen. Stipe short, scaleless. Frond oblong-lanceolate, bipinnate, moderately firm, under a foot long, 3 in. broad at the middle, narrowed gradually to the base; main rachis densely crinite. Pinnæ lanceolate, $\frac{1}{2}$ in. broad, the central ones 1–1$\frac{1}{2}$ in. long, cut down to the rachis into linear-oblong segments $\frac{1}{12}$ in. broad. Veins simple, erecto-patent, 5–6-jugate. Sori subcostal. Indusium persistent.—Mount Knutsford. Simulates in habit the common American *N. conterminum.*

N. Filix-mas Rich.—Musgrave range. (Cosmopolitan, temperature).

N. near *sparsum* and *chinense.*—Mount Musgrave. Too incomplete for positive determination.

Nephrolepis acuta Presl.—Mount Musgrave. (Warmer regions of both hemispheres).

Polypodium punctatum Thunb.—Widely spread in both hemispheres.

55.* **Polypodium** (Phegopteris) **loxoscaphoides** Baker, n. sp. —Stipe short, slender, naked, castaneous. Frond oblong-deltoid, decompound, a foot long, moderately firm, green and glabrous on both sufaces. Lower pinnæ the largest, oblong-lanceolate subequilateral, 4–5 in. long. Ultimate segments $\frac{1}{12}$ in. long, cuneate with two veins or oblong with a single vein, with a single sorus dorsal on the vein in the centre of the segment. No indusium seen.—Mount Musgrave and 9200 ft. on Owen Stanley range. Habit of *Davallia* (*Laxoscaphe*) *gibberosa* and *nigrescens*.

98.* Polypodium (Eupolypodium) trichopodum F. Muell. Record, p. 41.—Rhizome short-creeping, $\frac{1}{8}$ in. diam., densely clothed with small ovate imbricated pale brown paleæ. Stipes very slender, contiguous, brown, wiry, clothed with inconspicuous fine spreading hairs. Frond simple, linear, obtuse, entire, 1–2 in. long, $\frac{1}{6}$ in. broad, narrowed gradually to the base, thick and moderately firm in texture, clothed with fine spreading brown hairs. Veins erecto-patent, forked. Sori globose, superficial, costal.—Mount Victoria and Mount Knutsford. Very distinct.

99.* **Polypodium** (Eupolypodium) **mollipilum** Baker, n. sp.—Rootstock not seen. Stipe slender, brown, wiry, 1–$1\frac{1}{2}$ in. long, clothed with fine spreading hairs. Frond simple, linear, entire, 3–4 in. long, $\frac{1}{4}$ in. broad at the middle, narrowed gradually to the base and apex, moderately firm and thick, densely clothed with fine spreading brown hairs. Veins forked. Sori globose, superficial, costular.—Near the summit of the Owen Stanley range. Near *P. Hookeri* Brack., and *P. hirtum* Hook.

101*. **Polypodium** (Eupolypodium) **Stanleyanum** Baker n. sp. —Rootstock not seen. Stipe naked, $\frac{1}{2}$ in. long. Fronds linear, obtuse, entire, 3–5 in. long, $\frac{1}{4}$–$\frac{1}{3}$ in. broad, very thick and rigid in texture, glabrous and scaleless, narrowed gradually from the middle to the base. Veins quite hidden. Sori globose, superficial, medial between the midrib and edge, confined to the upper part of the frond.—Near the summit of the Owen Stanley range. Allied to *P. zeylanicum* Mett.

101.* **Polypodium** (Eupolypodium) **Knutsfordianum** Baker, n. sp.—Rhizome short-creeping, $\frac{1}{12}$ in. thick, clothed with small pale brown ovate densely imbricated paleæ. Stipe very short, densely clothed with brown spreading hairs. Frond simple, linear, entire, 3–4 in. long, $\frac{1}{4}$ in. broad, firm in texture, clothed with a few spreading brown hairs, obtuse, narrowed gradually to the base. Veins distinct, furnished with 2 short anterior branches. Sori globose, superficial, forming 2 spaced-out rows near the midrib.—Mount Knutsford. Also allied to *P. zeylanicum*.

108.* **Polypodium** (Eupolypodium) **subselligueum** Baker, n. sp.—Rootstock not seen. Stipe naked, $1\frac{1}{2}$–2 in. long. Frond simple, linear, entire, thick, glabrous, 5–6 in. long, $\frac{1}{4}$ in. broad at the middle, narrowed gradually to the apex and base. Veins quite hidden. Sori oblong, superficial, $\frac{1}{6}$–$\frac{1}{4}$ in. long, confined to the middle of the frond, placed close to the midrib and parallel with it and reaching nearly to the edge.—Mount Knutsford. Stands on the line of boundary between *Polypodium*, section *Grammitis* and *Gymnogramme*, as understood in ‘Synopsis Filicum.’

P. diminutum Baker ?—Mount Knutsford and Mount Victoria. Differs a little from the Lord Howe's Island plant in paleæ, stipe and sori, and is perhaps a distinct species.

110.* **Polypodium** (Eupolypodium) **scabristipes** Baker n. sp. —Rootstock not seen. Stipe brown, wiry, scabrous, 2–3 in. long. Frond simple, linear, entire, 5–6 in. long, $\frac{1}{3}$ in. broad at the middle, thick, rigid, nearly glabrous, narrrowed to the base. Veins forked, erecto-patent. Sori oblong, oblique, rather immersed, $\frac{1}{12}$ in. long, placed in a row nearer the midrib than the edge.—Near the summit of the Owen Stanley range. Near the Malayan *P. fasciatum* Mett.

111.* **Polypodium** (Eupolypodium) **locellatum** Baker, n. sp.—Rhizome short-creeping, $\frac{1}{6}$ in. thick, densely clothed with small ovate-lanceolate pale-brown paleæ. Stipes slender, naked, wiry, erect, 2–3 in. long. Fronds simple, linear, entire, glabrous, thick, rigid, 5–6 in. long, $\frac{1}{6}$ in. broad at the middle, narrowed gradually to the base and apex. Veins hidden. Sori oblong, oblique, immersed in deep pits, forming a long row nearer the midrib than the margin.—Mount Victoria. Very distinct in *Polypodium*, section *Grammitis*, by its deeply immersed sori.

133.* **Polypodium** (Eupolypodium) **Musgravianum** Baker, n. sp.—Stipes tufted, very slender, nearly naked, $\frac{1}{2}$–1 in. long. Fronds linear, 1–1$\frac{1}{2}$ in. long, $\frac{1}{8}$ in. broad, firm, glabrous, cut down to the rachis into ovate adnate erecto-patent pinnæ, with a single large globose superficial sorus at the base. Veins forked.— Mount Musgrave, 7000–8000 ft. Allied to *P. trichomanoides* and *exiguum*.

P. blechnoides Hook.—Near the summit of Owen Stanley range. (Queensland and Polynesia).

P. obliquatum Blume.—New Guinea highlands, 9200 ft. (South India, Ceylon, Philippines, Malay isles).

141.* **Polypodium** (Eupolypodium) **undosum** Baker, n. sp.—Rootstock not seen. Stipe naked, wiry, 1–1$\frac{1}{2}$ in. long. Fronds pendulous, lanceolate, glabrous, simply pinnate, coriaceous, 5–6 in. long, $\frac{1}{2}$ in. broad, cut down to the rachis into numerous adnate non-contiguous obtuse subtrapezoid pinnæ, $\frac{1}{12}$–$\frac{1}{8}$ in. broad, deeply crenate, especially on the upper margin. Veins hidden. Sori globose, superficial, when mature filling nearly the whole surface of the pinnæ.—Mount Musgrave. Near *P. Grammitidis* R. Br.

168.* **Polypodium** (Eupolypodium) **davalliaceum** F. M. and Baker, n. sp.—Rhizome short-creeping, $\frac{1}{12}$ in. thick, clothed with small brown ovate-lanceolate paleæ. Stipes wiry, naked, 1–2 in. long. Fronds coriaceous, glabrous, lanceolate, simply pinnate, 6–8 in. long, under an inch broad, cut down to the rachis into adnate lanceolate or obliquely cuneate pinnæ $\frac{1}{16}$–$\frac{1}{12}$ in. broad, entire or obscurely crenate on the upper edge. Veins hidden. Sori solitary, immersed near the tip of the pinnæ with the edge folded round them and the tip of the pinna protruding beyond them.—Mount Victoria and near the summit of the Owen Stanley range. A very distinct and curious plant, receding from typical *Polypodium* in the direction of *Davallia*, section *Prosaptia*.

212.* **Polypodium** (EUPOLYPODIUM) **bipinnatifidum** Baker, n. sp.—Rootstock not seen. Stipe very slender, 1½–2 in. long, clothed with fine spreading brown hairs. Frond oblong-lanceolate, bipinnatifid, pendent, subcoriaceous, glabrous, 5–6 in. long, an inch broad. Pinnæ distant, linear, cut down to a narrowly-winged rachis into small ovate or oblong lobes, each containing a single vein and a single globose superficial sorus.—Near the summit of the Owen Stanley range. Near *P. torulosum* Baker in Hook., Ic. t. 1673, and *P. pozozuense* Baker in Hook. Ic. t. 1672.

P. nigrescens Blume.—Mount Musgrave. (India to Queensland and Polynesia).

P. Dipteris Blume.—Mount Knutsford. (Malay and Polynesian isles).

P. triquetrum Blume ?—Near the summit of the Owen Stanley range. (Malay and Polynesian isles). A plant gathered at 9200 ft. on Mount Musgrave with large uniserial sori filling up nearly the whole under surface of a paleaceous lanceolate fertile frond under half an inch broad, may be a contracted montane variety of this species.

Gymnogramme caudiformis Hook.—Mount Knutsford. (India to Tahiti).

Vittaria elongata Sw.—Near the summit of the Owen Stanley range. (Tropical regions of the Old World).

V. lineata Sw.—Mount Musgrave. (Warmer regions of both hemispheres).

Tænitis blechnoides Sw.—Mount Knutsford. (India to Polynesia).

Acrostichum bicuspe Hook. — Mount Knutsford. (Java and Formosa).

SCHIZŒACEÆ.

Schizæa dichotoma Sw.—Mount Musgrave. (Widely spread in both Old and New World).

LYCOPODIACEÆ.

Lycopodium Hamiltonii Spreng.—Near the summit of the Owen Stanley range. (India, Ceylon, West China).

37†. **Lycopodium Macgregori** Baker, n. sp.—Stem slender, pendulous, copiously dichotomously forked, a foot or more long. Leaves lax, ascending, lanceolate, acute, moderately firm, bright green, $\frac{1}{6}$ in. long. Sporangia placed in the axils of the unaltered upper leaves.—Mount Knutsford. Nearest the common Tropical American *L. linifolium* L.

L. verticillatum L.—Mount Musgrave. (Widely spread in both hemispheres).

L. squarrosum Forst.—Mount Musgrave. (Tropics of the Old World).

L. varium R. Br. — Mount Musgrave. (Australia and New Zealand).

L. cernuum L.—Near the summit of the Owen Stanley range. (Warmer regions of both hemispheres).

L. clavatum L.—Mount Musgrave and near the summit of the Owen Stanley range. (Cosmopolitan; temperate).

L. Wightianum Wall.—Mount Knutsford and near the summit of the Owen Stanley range.) Neilgherries, Ceylon, Java). Doubtfully distinct from *L. alpinum.*

L. scariosum Forst.—Mount Knutsfurd. (New Zealand, Australian Alps, Tropical America).

L. volubile Forst.—Mount Musgrave. (Penang to New Zealand and Polynesia). Not included in the new set of specimens.

SELAGINELLACEÆ.

Selaginella latifolia Spring. ? — Mount Musgrave. (Ceylon to Polynesia).

EQUISETACEÆ.

Equisetum debile Roxb.—Mount Knutsford, teste Sir F. Mueller. (India to Fiji).

It will be seen the number of species of Vascular Cryptogamia collected during the expedition was 70, and that of these 20 appear to be new and endemic. It is probable that, as Baron von Mueller suggests, some of these came from a lower level than the 64 flowering plants dealt with in his paper. The proportion of novelties is, as might be expected, smaller in the ferns than in the flowering plants, but to get so many new species as the result of a single hurried visit, makes one expect great things when these mountains can be explored more leisurely. As will be seen, most of the fifty species already known are familiar characteristically Malayan and Polynesian types. Cosmopolitan temperate types are represented by *Hymenophyllum tunbridgense, Aspidium aculeatum, Nephrodium Filix-mas* and *Lycopodium clavatum.* In Lycopodiaceæ *Lycopodium Hamiltonii* is a characteristically Indian, and *L. varium* a characteristically Australian and New Zealand species.

PLANTS FOUND IN KERRY, 1889.

By Reginald W. Scully, F.L.S.

Most of the time I devoted to Kerry last summer was spent in the southern or mountainous portion of the county, several weeks being divided between Glencar Valley, Waterville and its vicinity, and Kenmare Bay, more especially its northern side. A short visit was also paid to Ballybunnion, a small seaside village lying in the northern or comparatively level portion of Kerry. These districts would repay further search, and I can only hope that other botanists may be tempted to explore the more remote portions of this and other Irish counties where much, I am sure, still remains to be done.

Juncus tenuis Willd., an addition to the Irish Flora, was the most interesting plant found; a note on its occurrence and localities will be found in Journ. Bot. 1889, p. 335.

Nitella gracilis Agardh, is also most probably an addition to our Flora, its only claim to be considered Irish having hitherto been the unsatisfactory record, "Glencree, D. Orr," where it has not been found subsequently. I gathered this minute plant, growing with *Naias flexilis*, *Nitella translucens*, and *N. flexilis*, at the south end of Caragh Lake; it came up in some abundance on the mud adhering to the prongs of a small dredge kindly sent to me by the Messrs. Groves, which I found most useful.

Scirpus parvulus R. & S., was discovered growing in great abundance along the tidal portion of the River Cashen, above Cashen Bridge. This find was the more welcome, since the only other Irish locality for this *Scirpus* was the mouth of the Avoca River, Co. Wicklow, where I fear the plant has been completely destroyed by the new harbour-works.

A most unexpected plant found last summer was *Polygonum arifolium* L., a native of Canada and the United States, in low grounds. I am not aware of this plant having hitherto been recorded among British aliens. This desperately prickly *Polygonum* was growing abundantly on the dry stony bed of a small stream at Castle Cove, on Kenmare Bay, about six miles east of Darrynane. It occurred within a few hundred yards of the sea, just above tidal influence, and below a small pool apparently used for washing clothes by the few cottagers in the neighbourhood. The *Polygonum* was usually but a few inches in length, but some of the plants I gathered had branches over a foot long. I find it hard to account for the presence of this small annual here. Tillage is rare in the neighbourhood, and neither mills nor harbour near; however, my further investigations here were cut very short by a drenching thunderstorm.

Simethis bicolor Kunth. I was glad to find that this plant has a wider range than had hitherto been supposed. I found the *Simethis* in many spots between Darrynane, its recorded locality, and Reenronee, a small point in Kenmare Bay, some eight miles further east; it also occurred more than a mile inland, about half-way between these points; while about Darrynane it extends from Lamb's Head on the south, to Sheehan's Point on the north, with many intermediate localities.

This extreme south-west corner of the county seems also to be the head-quarters of *Microcala filiformis* and *Carex punctata*, both of which are very abundant here, though the *Carex* is almost restricted to Kenmare Bay.

Pilularia globulifera L., new to the south of Ireland, was also found last summer, growing sparingly in a few inches of water in the Upper Lake, Killarney.

As to the Kerry Potamogetons of 1889, I have again to thank Mr. Arthur Bennett for his kindness in looking over several puzzling plants. Among these was a large gathering of the *Potamogeton* I had sent him in 1888, labelled "*P. polygonifolius*, submerged form," and about which there was then some doubt; however, after examining last year's series, Mr. Bennett seems satisfied the plant is rightly named. It is probably the form which Syme called "*P. polygonifolius* v. *pseudo-fluitans*," and is a common plant in most of the Kerry mountain streams. Another visit was also paid to the River Laune, a regular storehouse of puzzling forms. A plant gathered in the river near its exit from the lake Mr. Bennett names *P. nitens* var. *latifolius* Tis. Seeing this curious form growing on the spot, it seemed hard to resist the conviction that the plant was a hybrid, with *P. perfoliatus* (which is the most abundant pondweed in this portion of the river) as one of its parents. Another form, gathered lower down the river, Mr. Bennett names *P. nitens* var. *salicifolius* (Fr. ?), and says that some of my specimens so exactly match others gathered by Mr. C. Bailey in Scotland, near Oban, that they might have been taken off the same plant; this form is very abundant in the river. Of the above two plants, both fresh and dried examples were sent to Croydon. The chief object, however, of this visit to the Laune was to gather fresh specimens of the plant sent by me to Mr. Bennett in 1888, and thought by him to be a form of *P. Zizii*. I had gathered this near the Killorglin end of the Laune, about sixteen miles from the lake, and though last summer I descended the river six or seven miles, I could find nothing to quite match the *P. Zizii* form, its place being here taken by *P. nitens* var. *salicifolius*. Mr. Bennett sums up the differences between these two plants by pointing out that while the peduncles and spikes (immature) of the 1888 plant belong to the *lucens* type, those of the 1889 plant are of the *nitens* type; and that while the leaves of the former are only narrowed into the stem, those of the latter are certainly amplexicaul. I notice also that the long narrow leaves of the 1888 plant often have the *lucens* "mucro," while the leaves of the 1889 plant have not. I have little doubt these three Potamogetons are hybrids, and that several interesting problems in this troublesome genus are waiting to be worked out in the River Laune. I am glad to learn Mr. Bennett has succeeded in growing some of the plants I sent him last summer, so we may hope for some light on the subject before long.

Several interesting Carices were also gathered, including some apparent hybrids. More *Carex aquatilis* Wahl. was discovered round the head of Caragh Lake, and what seems the same plant was found growing abundantly along a small boggy stream among the mountains, near the head of the Upper Lake, Killarney. The fertile spikes of this plant were erect, and I could see no veins on the fruit; but some of the specimens gathered appear to come very near to *C. acuta*, while the whole plant was much greener and stronger than the Caragh Lake *C. aquatilis*. A form of *C. præcox* Jacq. was found, in which the stalk of the lowest spike sometimes exceeds two inches in length, with the sheathing base of the bract over half an inch long; in one specimen gathered, the lowest spike springs from a bract near the base of the stem, and its stalk of fully ten inches brings the spike to nearly its usual position in

C. præcox. Mr. Bennett tells me this form has been called *Carex mollis* by Host. In occurred in some plenty on a boggy common.

Sisyrinchium angustifolium Mill. Through the kindness of Lady Godfrey, of Kilcolman Abbey, I received living specimens of this plant, gathered near Milltown, Kerry, early last June. In Journ. Bot. 1889, p. 86, I have described an unsuccessful search for this plant in the above locality, and am glad, therefore, to see that the *Sisyrinchium* still exists there, our failure to find it apparently resulting from being a month too late.

In the following list, plants marked I. are additions to District I. of the 'Cybele Hibernica' and its Supplement.

‡_Aquilegia vulgaris_ L. A plant or two at Blackwater Bridge, Kenmare Bay,

*_Barbarea præcox_ R. Br. Roadside near Kenmare.

Arabis sagittata DC. The typical plant seems rarer in Kerry than a form which approaches the var. *glabrata* of Syme; the latter is the common Kerry sandhill form, and has no doubt sometimes been mistaken for *A. ciliata*. I have not yet gathered typical *A. sagittata* on any of the numerous sandhills round this coast.

Lepidium latifolium L., is recorded in Smith's 'Kerry' as occurring near the head of Kenmare River. I searched the whole of this rather vague locality last summer, without seeing a trace of this conspicuous plant.

Raphanus maritimus Sm. I. In several places near Darrynane, and sparingly near the Spa, Tralee, and Ballybunnion.

*_Silene noctiflora_ L. I. A plant or two in a sandy field near Ballybunnion.

Arenaria serpyllifolia var. *leptoclados* (Guss.). Along railway near Killarney.

Elatine hexandra DC. A common plant in most of the lakes in the mountainous part of the county.

†_Malva moschata_ L. Several localities around Kenmare, as along the River Roughty; perhaps an escape.

Trifolium striatum L. I. Limestone bluff, Kilfenora, Tralee Bay.

‡_Prunus insititia_ L. Darrynane woods.

Rosa arvensis Huds. By the River Flesk, Killarney; Blackwater Bridge, Kenmare Bay, &c. Not a common plant in Kerry.

Pyrus Aria var. *rupicola* Syme. This variety seems to be the plant of the Killarney Lakes; I have not yet noticed the type.

Saxifraga Geum L. I gathered a form of this plant with *crenate* teeth in several places among the mountains between Waterville and Darrynane, the extreme south-west corner of Kerry. In this character the plant approaches nearer to the Spanish type than to our usual Irish variety which has *serrate* teeth. Intermediate states were, however, found with varying teeth and every degree of hairiness. I found a nearly similar form more sparingly near Torc Lake, Killarney. — *S. hirsuta* L. Near Waterville; Blackwater Bridge, &c. Not a rare plant, but much less frequent than *S. Geum;* one may well hesitate, however, seeing the almost innumerable leaf-forms of these two plants, before picking out any one of them and giving it specific rank.—*S. umbrosa* var. *punctata* Don. Horses Glen, Mangerton. — Var. *serratifolia* Don. Blackwater Bridge, Kenmare Bay.

Drosera anglica var. *obovata* (M. & K.). I. Large bog in Glencar Valley; a rare variety in Kerry, where the typical *anglica* is common.

Anthriscus sylvestris Hoffm. Along the Blackwater River, Kenmare Bay; the only locality so far known to me in Kerry.

‡*Sambucus Ebulus* L. Hedges near Darrynane and Ballybunnion.

Rubia peregrina L. Several places about Darrynane and Kenmare.

Antennaria dioica R. Br. Near the Cloonee Lakes, Kenmare Bay, a little above sea level. This plant is usually montane and very rare in Kerry.

**Senecio vulgaris* L., var. For the last two summers I have noticed a *Senecio* growing abundantly about the railway-station and along the line at Killarney. It differs, apparently, in nothing from the rayed form of *S. vulgaris*, except that the rays are *never* revolute. I was interested to see the same plant growing plentifully with *S. squalidus* about the railway, &c., in Cork; this is no doubt the plant found here by Mr. Carroll, for which the names of *hibernica* and *vernalis* have been suggested. It has evidently now spread to Killarney by railway transport, and maintains itself there unchanged. Mr. N. Colgan noticed this *Senecio* about Killarney in 1886, and it seems strange there is still no sign of *S. squalidus*, though the latter is the more abundant in Cork. For my own part, I am satisfied to call the plant *S. vulgaris* var. *radiatus* Koch.

‡*Carduus pycnocephalus* Jacq. About Ballinskelligs Castle and Abbey, and sparingly near Ballybunnion; very rare in Kerry.

Hieracium anglicum Fr. Shores of Torc Lake, Killarney; Paps Mts.; and Horses Glen, Mangerton. — *H. iricum* Fr. Shores of Lower and Torc Lakes, Killarney, and Paps Mts.—*H. murorum* L. pt. I. Woody bank near Glenflesk Castle, Killarney.

‡*Lactuca muralis* Fresen. I. Several plants were noticed, growing in the shrubberies near Glenflesk Castle, Killarney. I have not yet found it elsewhere in Kerry, and as it is one of our rarest Irish species, the plant may not be indigenous here.

Wahlenbergia hederacea Reichb. By the River Roughty, near Kenmare, and along the Blackwater, Kenmare Bay.

Arbutus Unedo L. Several old and half-dead trees in the cliffs on the south side of Waterville Lake.

Microcala filiformis Link. Very abundant along Kenmare Bay, on roadsides, wet fields, bogs, &c.; round Ballinskelligs Bay.

Blackstonia perfoliata Huds. Two or three spots near Ballybunnion; very rare in Kerry.

†*Solanum nigrum* L. Sparingly by the shore in one or two places near Kenmare Bay.

Orobanche Hederæ Duby. Several localities about Darrynane.

Pinguicula vulgaris L. At about 2200 ft. in Coumloughra

Reeks; and at 1400 ft. near Waterville. A rare plant in Kerry, where *P. grandiflora* takes its place.

**Mentha sylvestris* L. In the stream below Caherdaniel, Darrynane.—‡*M. Pulegium* L. By the town wells at Kenmare.

Origanum vulgare L. On limestone about Kenmare; rare in Kerry.

Calamintha Clinopodium Benth. On a limestone knoll between the Middle and Lower Lakes, Killarney; a very rare plant in Ireland.—*C. officinalis* Moench. On limestone about Kenmare.

**Polygonum arifolium* L., I. Kenmare Bay (already noticed).

**Salix pentandra* L. Not rare in hedges about West Cove and Sneem, Kenmare Bay. — *S. Smithiana* Willd. Common in the county.

Juniperus nana Willd. In several places about sea-level near Darrynane, with *Empetrum nigrum.*

Habenaria albida R. Br. Sparingly in Glencar Valley. — *H. viridis* R. Br. Widely spread over the county, but a rare plant.

Simethis bicolor Kunth. My visit to Darrynane last summer was too late to find this plant in perfection. By the tenth of July, several weeks of hot weather had burnt most of the plants to a light-brown, a tint that aided me materially in discovering the *Simethis* elsewhere. This plant seems to love exposed cracks in the rocky knolls, and sometimes grows in such situations with leaves more than sixteen inches long by a third of an inch broad. I found it still flowering, only on the west side of the Abbey Island, on a slope exposed to the Atlantic. The *Simethis* grew here plentifully, but very stunted, pushing its way through a dense prostrate undergrowth of *Ulex* and *Erica*, above which its leaves were bent and twisted into every shape, or apparently eaten off by sheep. The Rev. E. F. Linton kindly sent me a specimen of the Bournemouth *Simethis*, which seems a much more slender and delicate plant than the usual Kerry state.

‡*Allium Scorodoprasum* L. Very abundant in the Darrynane shrubberies, and sparingly near an old castle at the head of Kenmare Bay.

Juncus tenuis Willd. Kenmare Bay (already noticed).

Potamogeton polygonifolius Pour., "submerged form." In many of the Kerry mountain streams. — *P. rufescens* Schrad. Caragh Lake and River. — *P. nitens* var. *latifolius* Tis. River Laune. — Var. *salicifolius* (Fr. ?). River Laune. — *P. prælongus* Wulf. Near Victoria Bay, Lower Lake, Killarney; this is also recorded from the Kerry Blackwater, I fancy in error.

Eriocaulon septangulare With. Very abundant in the Cloonee Lakes and other lakes about Kenmare Bay.

Scirpus parvulus R. & S. Near Ballybunnion (already noticed). —*S. rufus* Wahlb. Darrynane estuary,

Eriophorum latifolium Hoppe. Glencar Valley and near Staigue Fort, Kenmare Bay.

Rhynchospora fusca R. & S. A common plant in south Kerry; rare in the north of the county.

Carex dioica L. Glencar Valley; near Sneem, Kenmare Bay.

—*C. divulsa* Good. Limestone rocks, head of Kenmare Bay.—*C. aquatilis* Wahl. Several spots, south end of Caragh Lake; by old Kenmare road near Upper Lake, Killarney.—*C. Goodenowii* var. *juncella* Fr. Upper Lake, Killarney.—*C. limosa* L. In most of the larger Kerry bogs.—*C. præcox*, form called *C. mollis* by Host, in a boggy common between Sherehee and the River Flesk, Killarney (*vide antea*).— *C. punctata* Gaud. Sparingly near Hog's Head, Waterville, and very abundant about Darrynane and along Kenmare Bay.—*C. filiformis* L. South end of Upper Lake, Killarney, and abundant round a small lake near it.

Glyceria plicata Fr. Near Waterville.

**Bromus erectus* Huds. I. Sparingly in a field at South-hill, Killarney. This plant, with *Crepis taraxacifolia* and *Linaria viscida*, is spreading with great rapidity along the railway tracks in Ireland; the *Linaria* can, in fact, be already traced along the ballast, from Dublin to the extreme end of that railway at Castleisland in Kerry.

Trichomanes radicans Sw. I was shown some stunted scraps of this now very rare fern, on Torc Mtn., Killarney.

Phegopteris polypodioides Fée. Very fine in a gully on the Paps Mtn., Killarney, and above Lough Reagh; Upper Glencar.

Ophioglossum vulgatum L. Darrynane Wood; and near the head of Kenmare Bay.

Equisetum variegatum var. *Wilsoni* Newm. On a damp cliff, Paps Mtn., Killarney, at about 1500 ft.

Pilularia globulifera L. I. Sparingly at south end of Upper Lake, Killarney.

Chara fragilis var. *capillacea* C. & G. Bog-holes near Waterville, &c.—*C. vulgaris* var. *papillata* Wallr. Near Waterville.

Nitella gracilis Agardh. South end of Caragh Lake (*vid antea*).—*N. translucens* Agardh. Caragh and Waterville Lakes, &c. — *N. flexilis* Agardh, Caragh, Acoose and Waterville Lakes, &c.

My best thanks are, as usual, due to Mr. Arthur Bennett, Messrs. Groves, Mr. Hanbury, and Mr. A. G. More.

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.

By James Britten, F.L.S., and G. S. Boulger, F.L.S.

(Continued from p. 91.)

Park, Mungo (1771–1805): b. Foulshiels, near Selkirk, 10th Sept. 1771; d. Niger, 1805. Traveller and surgeon. A.L.S., 1793. Brother-in-law of James Dickson. Protégé of Banks. Went to India and Sumatra, 1792; to Africa, 1795–1797, 1804–1805. Plants in Brit. Mus. Life prefixed to 'Journal,' 1805–1815. 'Life,' 1838. Rees, Suppl. Hist. Berw. Nat. Club, x. 300. Portr. prefixed to 'Travels,' 1799. *Parkia* Br.

Parker, Charles Sandbach (d. 1868 or 1869): b. Glasgow; d. 1868 or 1869. Of Aigburth, Liverpool. Studied under DeCandolle at Geneva. Collected in Dutch Guiana and West Indies, 1824. Hook. Exot. Fl. t. 147; R. S. C. iv. 758; Lasègue, 492. Herbarium at Kew. *Parkeria* Hook.

Parker, John Cowham (c. 1774–1841): b. circ. 1774; d. Hull?, 1841. Wine-merchant, of Hull. One of founders of Hull Bot. Garden. "An enthusiastic botanist," R. W. Corlass, 'Sketches of Hull Authors,' 1879, 108.

Parkinson, James (fl. 1780–1833). F.G.S. Surgeon. Practised at Hoxton. 'Organic Remains,' 1804–1811. Pritz. 240; Jacks. 589; R. S. C. iv. 760; Mantell, 'Pictorial Atlas of Fossil Remains,' 1850, p. 13.

Parkinson, John (1567–1650): b. Nottinghamshire (?), 1567; d. London, Aug. 1650; bur. St. Martin's-in-the-Fields. Apothecary. King's Herbarist ('Botanicus Regius Primarius'). 'Paradisus Terrestris,' 1629. 'Theatrum Botanicum,' 1640. Had a garden in Long Acre, 'Theatrum,' 609. Pult. i. 138; Rees; Pritz. 240; Jacks. 589; Loudon, 'Arboretum,' 49, 53. Journ. Hort. xxviii. 1875, 493, with portr. Portr. by C. Switzer in 'Paradisus'; and one by W. Marshall in 'Theatrum,' re-engraved in Richardson's Illustr. to Granger. *Parkinsonia* L.

Parkinson, John (d. 1847); d. Paris, 3rd April, 1847. F.R.S. F.L.S., 1795. Consul-General in Mexico. Sent dried and living plants to Kew. Bot. Biol. Centr. Amer. iv. 128; Proc. Linn. Soc. i. 336.

Parkinson, Sydney (d. 1771): b. Edinburgh; d. Indian Ocean, Jan. 1771. Woollen-draper. Protégé of Banks, with whom to South Seas in 'Endeavour' as draughtsman, 1768. Drawings in Dept. Bot., Brit. Mus. 'Journal of Voyage,' 1784 (*cfr.* "Preface" and "Explanatory Remarks": list of plants, 37–50). Portrait prefixed to 'Journal,' engr. Jas. Newton. Pritz. 240; Jacks. 223.

Parks, John Damper (fl. 1823). Collector for Hort. Soc. in China and Java, 1823. Trans. Hort. Soc. v. 427.

Parnell, Richard (d. 1882); b. Devonshire; d. Edinburgh, 1882. Ichthyologist. M.D. F.R.S.E. Orig. Memb. Bot. Soc. Edinb., 1836. Lived in Jamaica, 1839. 'Grasses of Scotland,' 1842; 'Grasses of Britain,' 1845; both with figs. drawn and engraved by himself. Pritz. 241; Jacks. 589; Journ. Bot. 1883, 30; R. S. C. iv. 763. Herbarium of grasses at Linn. Soc. *Poa Parnellii* Bab.

Parry, Charles Christopher (1823–1890): b. Admington, Worcestershire, 28th Aug. 1823; d. Davenport, Iowa, 20th Feb. 1890. Went to America, 1832. M.D. Botanical explorer and collector. On Mexican Boundary Survey, 1850; in Rocky Mountains, 1861. Botanist to Agric. Dept. Washington, 1869–71. 'Chorizanthe,' 1884, 1889, and various bot. papers. Friend of Torrey and Gray. Herb. at Davenport Acad. Nat. Sciences. Jacks. 589; R.S.C. iv. 767; viii. 565; 'Garden and Forest,' iii. 120; Bull. Torrey Bot. Club, March, 1890. *Pinus Parryana* Engelm.

Parry, Sir William Edward (1790–1855): b. Bath, 19th Dec. 1790; d. Ems, 8th July, 1855; bur. Greenwich Cemetery. Arctic explorer. Rear-Admiral, 1852. F.R.S., 1821. D.C.L.. Oxon, 1829. Knight, 1829. Plants at Kew and Mus. Brit. 'Memoirs' by Rev. Edw. Parry, 1857, with portr. by G. Richmond, 1842, engr. Lane. *Parrya* Br.

Parsons, James (1705–1770): b. Barnstaple, Devon, March, 1705; d. Bloomsbury, 4th April, 1770; bur. Hendon. M.D., Rheims, 1736. F.R.S., 1741. Practised in London. 'Microscopical Theatre of Seeds,' 1744. 'Analogy between Propagation of Animals and Vegetables,' 1752. 'Pharmacopœia Edinburgensis,' 1752. Rees; Pritz. 241; Jacks. 589; Munk, ii. 175. Portr. by Wilson in Mus. Brit. *Parsonsia* P. Browne = *Cuphea* Jacq. *Parsonsia* Br.

Partington, Charles Frederick (fl. 1820–1838). Editor, 'British Cyclopædia.' 'Introduction to Science of Botany,' 1835. Jacks. 39.

Pasmore, Rev. Henry (d. before 1699): d. Jamaica, before 1699. Sent plants to Petiver. Mus. Pet. 46.

Paterson, John Ligertwood (1820–1882): b. Midmar, Aberdeensh., 1820; d. Brazil, 9th Dec. 1882. M.D. F.B.S.Ed., 1872. Trans. Bot. Soc. Edinb. xvi. 9.

Paterson, William (d. 1810): b. Montrose?; d. on voyage from Australia, 21st June, 1810. Colonel. F.R.S. F.L.S., 1797. In S. Africa, 1777–79. 'Narrative of Journeys,' 1789. Lieut.-Governor, Botany Bay, 1800–1810. Collected in S. Africa and Australia. Brown, Prodr. 303; Fl. Tasmania, cxxiv.; Lasègue, 278, 446; Cott. Gard. viii. 329, &c.; ix. 3. Plants in Herb. Mus. Brit. *Patersonia* Br.

Patrick, Rev. William (fl. 1831). 'Indigenous Plants of Lanarkshire, with an introduction to Botany,' 1831. Pritz. 241; Jacks. 255.

Patton, George (1803–1869): b. 1803; d. Glenalmond, Perth, 30th Sept. 1869. Lord Justice Clerk of Scotland, 1867, as Lord Glenalmond. Chairman, Oregon Bot. Assoc. Introduced *Cupressus Lawsoniana* and *Abies Pattoniana*. Gard. Chron. 1869, 1043.

Paxton, Sir Joseph (1803–1865); b. Milton Bryant, Beds., 3rd Aug. 1803; d. Sydenham, 8th June, 1865. F.L.S., 1833. Foreman, Chiswick Arboretum, 1824. Superintendent, Chatsworth, 1826. 'Magazine of Bot.,' 1834. Travelled through S. Europe and Levant, 1838. 'Pocket Bot. Dictionary,' 1840. Knighted, 1851. M.P. for Coventry, 1854, Pritz. 242; Jacks. 590; Proc. Linn. Soc. 1865–6, lxxxi.; Gard. Chron. 1865, 554; Journ. Hort. viii. (1865), 446, with portr.; and ix. 12. Journ. Bot. 1865, 231. *Paxtonia* Lindl.

Peach, Charles William (1800–1886): b. Wansford, Northants, 30th Sept. 1800; d. Edinburgh, 28th Feb. 1886. Coastguardsman and geologist. A.L.S., 1868. Neill Medal, R.S.E., 1875. Papers on fossil plants in Trans. Bot. Soc. Edinb. xii. & xiii., &c. Proc. Linn. Soc. 1883–86, 146; R. S. C. iv. 791; Smiles, 'Robert Dick'; Scott. Nat. 1886, 289.

Pearce, Nathaniel (c. 1780–1820): b. East Acton, Middlesex, circ. 1780; d. Alexandria, 12th Aug. 1820. Lived in Abyssinia, 1809–1819. Sent plants to Brown. 'Account of Abyssinia,' New Monthly Mag. 1821. Plants in Herb. Mus. Brit. 'Life and Adventures,' autobiog., 1831; Salt's 'Abyssinia'; Michaud.

Pearce, Richard (d. 1868): d. Panama, 19th July, 1868. Of Stoke Devonport. Collector for Messrs. Veitch and Bull. Plants at Kew and Brit. Mus. Journ. Bot. 1868, 320; Gard. Chron. 1868, 874, 893; Journ. Hort. xv. (1868), 134. *Stemonacanthus Pearcei* Hook. f.

Pechey, John (1654–1693 or 1717): b. Chichester, Dec. 1654; d. Chichester, May, 1693, or June, 1717; bur. St. Peter the Less or St. Andrew, Chichester. B.A., Oxon, 1675. M.A., 1678. M.D. F.R.C.P., 1684. 'Herbal of Physical Plants,' 1694. Pult. i. 184; Pritz. 243; Jacks. 590; Munk, i. 433. *Pecheya* Scop.

Peddie, Lieut.-Col. (fl. 1840): Lieut.-Col. 72nd Regt. Collected at Natal, 1839–40. Journ. Bot. 1840, 124, 265. *Peddiea* Harv.

Peete, William (1771–1848): b. 27th June, 1771; d. Bromley, Kent, 4th Feb. 1848; F.L.S., 1794. Surgeon at Dartford 38 years. Described *Silene patens* for Eng. Bot. 2748. Contrib. to Phyt. i. 587. Proc. Linn. Soc. i. 377.

Penfold, Jane Wallas (fl. 1845). Lived in Madeira. 'Madeira Flowers, Fruits, and Ferns,' 1845 (plates drawn by her). Pritz. 243; Jacks. 352.

Penneck, Rev. Henry (1801–1862): b. Penzance, 1801; d. same place, 24th April, 1862. M.A., Camb., 1830; Oxon, 1847. Curate of Morvah, 1826. A.L.S. Contrib. to Eng. Bot. 850, 2818, 2845, &c. Had a herbarium. Gent. Mag. 1862, ii. 106; Jones, 'Bot. Tour,' Devon and Cornwall, 29, 30.

Penny, George (d. 1838 or 1839). Nurseryman. Of Epsom, Surrey. A.L.S., 1829. 'Hortus Epsomensis.' Proc. Linn. Soc. i. 36.

Penny, Rev. Thomas (d. 1589). B.A., Camb., 1551. M.A., 1559. D.D. F.R.C.P., 1582. Prebendary of St. Paul's, 1560. Entomologist. "A second Dioscorides," Gerard. Pult. i. 84; Lobel, 'Adversaria,' 358, 394, 397; Cooper, Athenæ Cantab. ii. 78; Munk, i. 82; Rose. *Myrtocistus Pennæi* Clusius = *Hypericum balearicum.*

Percival, Thomas (1740–1804): b. Warrington, 29th Sept. 1740; d. Manchester, 30th Aug. 1804. M.D., Leyden, 1765. F.R.S. Practised in Manchester from 1767. 'Perceptive Power of Vegetables,' Manchester Phil. Soc. Mem. ii. 1789, 122. 'Works,' with memoir, 1807; Pritz. 243; Jacks. 82; R. S. C. iv. 823.

Percy, John (1817–1889): b. Nottingham, 1817; d. June, 1889. Metallurgist. M.D., Edinb. F.R.S. M.B.S.E., 1837. Collected in S.E. France and Switzerland, 1836–7. Plants in Edinburgh University Herbarium. First Report Bot. Soc. Edinburgh, 43–45 (1836); Trans. B. S. Ed. xvii. 522.

(To be continued.)

SHORT NOTES.

Middlesex Plants.—A recent leader in one of the London journals, referring to the rapid extinction of rare plants in Great Britain, especially instanced Middlesex as having lost fifty-eight species within a comparatively recent period. This number is obviously obtained from Trimen & Dyer's 'Flora,' and although the actual loss is great enough to be deplored, it is happily not so great as these figures indicate, for it is certain that several species thus included have since been re-found, at least a fifth of them by myself alone. Amongst this list of losses the Orchids were conspicuous; indeed, all the less common species found a place there. It may therefore be some satisfaction to learn that nearly all the species hitherto recorded for the county were gathered last summer during an hour's evening stroll upon the hills of our very limited Chalk district. Thus *Orchis mascula*, *O. pyramidalis*, *O. maculata* (in one case with all the flowers inverted), *Ophrys apifera*, *O. muscifera*, *Neottia Nidus-avis*, and *Gymnadenia conopsea* were all gathered within the space of 100 yards. This was the first appearance of *Gymnadenia* above ground; at all events, it had hitherto eluded every search for it during many years, and probably it has not been gathered since Collinson's last record about 1790; only a single plant was seen, however. On another hill *Ophrys apifera* was abundant, and *Orchis pyramidalis* in such profusion that in one spot I counted seven plants growing in a circle of a few inches diameter. In the copse skirting the hill was *Habenaria chloroleuca;* in the valley beneath, *O. incarnata;* and further to the south, *O. latifolia*. I must confess that, seeing these orchids growing in such unusual abundance around me, it seemed an unaccountable mystery how they managed to get relegated to the limbo of "extincts"! Taking it for granted that *Orchis purpurea* was absolutely an error, *O. ustulata* is now the only species wanting to complete Blackstone's records. In his time (about 1737) he found it only "sparingly." Collinson (about 1790) owns that he could "never find this sort," so that it would appear to be irrecoverably lost. It is a curious fact that all the records of the old collectors are from the great "chalk-pit," where after many years' search I have never happened upon an orchid of any kind. Yet, as showing how tenaciously this and certain other species cling to a habitat without spreading beyond, in the woods intersected by the county boundary more than one Orchid, *Dentaria bulbifera*, and *Hordeum sylvaticum* grow on the Middlesex, and not on the Herts side, whilst *Cephalanthera grandiflora* and other plants are found in the Herts division only, notwithstanding that soil and other conditions are exactly similar, and that the plants in many instances grow at the very edge of the almost imaginary line which divides the wood—little more than a copse—into two artificial districts. With *Habenaria bifolia* secure near Edgeware, and *Orchis militaris* elsewhere, we may hope that our Orchids are safe for some time to come. It would indeed be matter for congratulation if as much could be said for sundry other plants which still linger on, but which we know too well are doomed in the near future.—J. Benbow.

Sciadium Arbuscula A. Braun. — A note appeared in the 'Scottish Naturalist' for last January on the occurrence of this plant at two localities in N.E. Scotland, in which Mr. John Roy states that "this, as far as I can make out, is the first time it has been found in Britain." I believe Mr. Roy is the first to give a definite station for it; I can add another, as in the early part of last summer I found fine examples of it on *Myriophyllum* from Crummock Water.—Wm. West.

Crepis fœtida L. in Northamptonshire. — In Morton's 'Nat. Hist. of Northamptonshire,' p. 364, 1712, he states:—"Of the plants described by botanists, but not known by Mr. Ray to be natives of our island, and therefore not noted in his 'Synopsis,' we may be assured the following is one, viz., *Hieracium Apulum flore Suave rubenti*, Col.: the *Hieracium annuum Amigdalas amaras olens*, D. Bobarti. This herb Mr. Bobart, the worthy Professor of Botany at Oxford, informs me he himself found in Northamptonshire, somewhere between Towcester and Whittlebury Forest, the particular place he could not recollect." An examination of the plants collected by the younger Bobart showed that there still exists a specimen labelled as above by Bobart, but unlocalised, which is *Crepis fœtida*, a plant not since recorded for the county. Dr. Lightfoot's (circa 1790) locality in Oxfordshire for the same plant is also lacking recent confirmation.—G. C. Druce.

NOTICES OF BOOKS.

Scientific Papers of Asa Gray. Selected by Charles Sprague Sargent. Vol. II.—Reviews of Works on Botany and related subjects, 1834–1887, pp. viii. 397. Vol. II.—Essays; Biographical Sketches, 1841–1886, pp. 503. London: Macmillan. Price £1. 1*s*.

In these two handsome volumes we have an acceptable selection from the scattered writings of the great American botanist who was taken from us little more than two years since, and a fitting memorial of their illustrious author. These writings, extending over more than half a century, are grouped by Prof. Sargent, who has fittingly undertaken the editorship of these selections, into four divisions:—Contributions to systematic botany; works of a purely educational character; critical reviews and biographies; and the series of papers "which owe their existence to the discussions which followed the publications of Mr. Darwin's 'Origin of Species.'" The first two are not republished, their essence having been already incorporated in later works, and the last group were reissued by their author in the interesting and insufficiently known work entitled 'Darwiniana.' The present volumes are therefore devoted to the third group of the four indicated above.

Prof. Sargent tells us that the selection of the articles for republication has been "an embarrassing and difficult task," and we can well believe it. Few men have written so long and so well as

Asa Gray; and few have embodied in their writings so much of the personal characteristics which attached to their author. Asa Gray's essays and sketches are reflections of the man who wrote them; and this is especially the case with the biographical contributions, extending over a period of nearly thirty years. Most, if not all, of the botanists commemorated were personally known to their biographer, many of them intimately so; and this gives an especial and critical value to these memoirs.

The essays are well calculated to show the wide grasp which Gray had of Botany as a whole. It may be said that there is an absence of anything indicating his sympathies with the leading school of the present day; but Gray was a systematist and general botanist, rather than an examiner of minute points of structure. The essay on "European Herbaria" has a special interest for us; those on the characteristics of the American flora are useful. The "Notes on the History of *Helianthus tuberosus*" are perhaps somewhat out of place here, as they mainly consist of a letter from Mr. Trumbull to Asa Gray.

The reviews, to which the first volume is devoted, extend from Lindley's 'Vegetable Kingdom,' in 1836, to Ball's 'Flora of the Peruvian Andes,' 1885; they embrace the works of chief importance in various branches of the science which have appeared between those dates, as well as some of less value, which serve as texts for conveying much useful and interesting information.

The last sentence of Prof. Sargent's preface, in which he speaks of "the second *and third* volumes of this series" is not quite easy to understand: the subjects allotted to these two being apparently combined in the second of the volumes before us. A third selection would be welcomed by many; but if, as we think, such is not now contemplated, we can heartily congratulate Prof. Sargent on the complete representation of Asa Gray's work which he has given in the volumes before us.

Practical Observations on Agricultural Grasses and other Pasture Plants. By William Wilson, jun. London: Simpkin, Marshall & Co. 1889. Pp. 117. Price 1*s.* 6*d.*

The author of this work is, we gather from its pages, a practical farmer. He deprecates the services of men not practically acquainted with the duties of the farm. They have by their "non-practical suggestions" raised a prejudice against science among agriculturists. Mr. Wilson comes to the rescue, and he points out "the value of practical men taking up any branch connected with agriculture, which fact is becoming to be properly recognised by agriculturists, as well as recognising the great neglect which, as a rule, has occurred in the matter of personal enquiry, and the consequent loss as regards condition of soil, value of properly-selected grasses and other plants, and the loss resulting from it of manure which the roots and other decayed parts form, which may be described as the manure received by natural causes."

In the record of his observations and experiences there is not a little confused writing like the sentence quoted. We fear Mr.

Wilson's style will seriously hinder the reader from getting hold of his practical investigations; and his imperfect knowledge of the Grasses often affects his conclusions. Take, for instance, his views about Rye-grass. The conflict of testimonies about this grass, he says, is caused by its not being suited to our climate. Its natural locality is the North of Italy, and we try to naturalise it beyond its proper range. Pacey's Rye-grass he considers to be a hybrid between Rye-grass and Meadow Fescue. Mr. Wilson is somewhat careless with his names. A botanist is prejudiced by finding at the outset that he introduces a novel spelling of "Graminneæ," and that he converts Sowerby into "Dr. Sowbery" or "Sowberry." Nevertheless a careful student, who can give the time to it, may find many useful suggestions in the pages of Mr. Wilson's volume.

Articles in Journals.

Bot. Centralblatt. (No. 9).—J. Röll, 'Ueber die Veränderlichkeit der Stengelblätter bei den Torfmossen' (concld.). — (Nos. 10, 11). P. Kunth, 'Ein Streit Kieler Botaniker zu Anfang des vorigen Jahrhunderts.' — (No. 10). B. Blocki, *Rosa ciliato-sepala*, sp. n.— (Nos. 12, 13). M. Willkomm, 'Vegetationsverhältnisse von Traz os Montes.'

Bot. Gazette (Feb.). — J. D. Smith, 'Undescribed plants from Guatemala' (*Oxalis dimidiata*, *Styrax guatemalensis*, *Campanæa picturata* (fig.), *Tradescantia subscaposa*, *Nephrodium duale* (fig.).— J. M. Coulter & W. H. Evans, 'Revision of N. American *Cornaceæ*' (*Cornus Greenei*, *C. Baileyi*, spp. nn.). — F. Renauld & J. Cardot, 'New Mosses of N. America' (3 plates).—W. G. Farlow, 'Poisonous action of *Clathrus columnatus*.' — C. B. Atwell, 'Chlorophyll in the embryo.'

Bot. Zeitung (Nos. 9, 10).—J. Behrens, 'Zur Kenntniss einiger Wachsthums- und Gestaltungsvorgänge in der vegetabilischen Zelle.' — H. Hoffmann, 'Ueber phænologische Accommodation.'— (Nos. 9–11). B. Stauge, 'Ueber chemotactische Reizbewegungen.' —(No. 12). H. Solms-Laubach, 'Die Sprossfolge der *Staugeria* und der übrigen Cycadeen.'

Bull. Soc. Bot. France (xxxvi.: Actes du Congrés, 1889: March 1). — J. Vesque, 'De l'emploi des caractères anatomiques dans la classification des végétaux.' — P. Vuillemin, 'La micrographie et la botanique descriptive.' — L. Guignard, 'Phénomènes morphologiques de la fécondation' (4 plates). — E. Bornet & C. Flahault, 'Sur quelques plantes vivant dans le test calcaire des mollusques' (6 plates).

Bull. Torrey Bot. Club (March). — N. L. Britton, Rusby's S. American Plants (new species of *Tibouchina*, *Axinæa*, *Meriania*, *Leandra*, *Miconia*).—L. H. Bailey, 'Carices of Keweenaw Peninsula.' —E. J. Hill, '*Pinus Banksiana*.'—T. C. Porter, 'The new edition of Gray's Manual.'—N. L. Britton, Memoir of C. C. Parry.

Gardeners' Chronicle (March 1.)—W. H. Blackmore, 'Longevity of Fern-spores.'—(March 8). *Fritillaria canaliculata* Baker, n. sp. —'Nomenclature of Orchids.' — (March 15). *Eupatorium probum* N. E. Br., n. sp. (fig. 48). — N. E. Brown, '*Arisæma anomalum*.'—

(March 22). *Zygopetalum Whitei* Rolfe, n. sp. — *Iris sindjarensis* (fig. 55).—(March 29). 'The Fingered Citron' (figs. 56, 58–60).

Journal de Botanique (Jan. 16). — L. Guignard, 'Sur la localisation dans les amandes et le laurier-cerise des principes qui fournissent l'acide cyanhydrique.' — B. Balansa, 'Catalogue des Graminées de l'Indo-Chine française' (*Bonia*, n. g.).— —. Hue, 'Lichens de Canisy (Manche).'—(Feb. 1). C. Sauvageau, 'Observations sur la structure des feuilles des plantes aquatiques.'—P. Hariot, '*Trentepohlia*.'—N. Patouillard, 'Flore mycologique du Tonkin.'

Oesterr. Bot. Zeitschrift. (March). — J. Weisner, 'Ueber das Saftperiderm.' — E. Hackel, *Streptochæta Sodiroana*, n. sp. — E. v. Halácsy, *Cirsium Heldreichii*, n. sp. — V. v. Borbás, 'Kahl- und behaartfrüchtige Parallelformen der Veilchen aus der Gruppe Hypocarpeæ.'—K. Bauer, 'Untersuchungen über gerbstoffrührende Pflanzen' (contd.).—J. Freyn, 'Plantæ Karoanæ' (contd.).

LINNEAN SOCIETY OF LONDON.

February 20, 1890. — W. Carruthers, F.R.S., President, in the chair.— Messrs. W. Eagle Clarke and J. H. Veitch were admitted, and Mr. James Jack elected Fellows of the Society. — Mr. G. C. Druce exhibited specimens of *Agrostis canina* var. *scotica*, and a small collection of flowering plants dried after treatment with sulphurous acid and alcohol, and showing a partial preservation of the natural colours of the flowers.—Sir John Lubbock then gave an abstract of four memoirs which he had prepared:—

(1.) "On the Fruit and Seeds of the *Juglandeæ*." In a previous paper I have described the peculiar four-lobed cotyledons of *Pterocarya*, and shown that this depends on the form of the seed, which resembles an anvil on four short stout legs. This form is again due to that of the fruit, the four projections of the seed having grown into four hollow spaces left in the solid woody tissue of the fruit. I have now traced the gradual development of the fruit from the flower, and compared the fruit of *Pterocarya* with that of the Walnut, in which, however, the hollow spaces developed in the fruit are much larger, so that, instead of a solid wall, with hollow spaces occupied by the seed, it gives the impression as if the seed was thrown into folds occupied by the wall of the fruit. To occupy these spaces fully the cotyledons themselves were thrown into folds as we now see them. The fruit of *Pterocarya* is much smaller than that of the Horse-chestnut, which was, doubtless, itself formerly not so large as it now is. As it increased, the cotyledons became fleshier, and found it more and more difficult to make their exit from the seed, until at last they have given up any attempt to do so. Hence the curious folds, with which we are so familiar, are the efforts made by the original leafy cotyledons to occupy the interior of the nut. Moreover, while essentially similar, the fruits of *Pterocarya* and of the Walnut offer several remarkable differences. The fruit of *Pterocarya* is winged, which is not the case with *Juglans;* it is much smaller, and a great deal harder. Again, the cotyledons of *Pterocarya* are aërial, while those of *Juglans* no longer perform the functions of leaves, and never quit the seed. In the Walnut, as in some other trees, it is an advantage that the seeds should be more numerous than large. In this way they are able to contain a supply of nutriment which suffices rapidly to carry the young plant above the grasses and other low herbage. Such seeds form the food of squirrels and other animals, which, accordingly, serve to disperse them, and thus, perhaps, they are able to dispense with any other means of transport. Moreover, for such large fruits, wings would perhaps be scarcely adequate. In *Pterocarya*, on the contrary, the fruits are much smaller, and wings are therefore more suitable. Possessing, then, themselves the means of dispersal, they have no need of offering any attractions to animals. In fact, every one which is eaten is so much pure loss. Hence, while the shell of the Walnut is sufficiently hard to protect the seed from the severity of weather, and from the attacks of insects, &c., which would not help in their dispersal, it offers no obstacle to larger animals. That of *Pterocarya* is, on the contrary, very hard and stony, and even the interior portion—the walls and pillars surrounding the four hollows—are of the same character, while in the Walnut they are comparatively quite soft. One reason why the similarity of construction in the two seeds does not at first strike the observer is that in *Pterocarya* the lobes of the seed evidently enter the fruit; in *Juglans*, on the contrary, the lobes are so much larger, that it rather seems as if the fruit sent projections into the seed. That the present condition of the Walnut seedling is not original we have interesting evidence in the presence of small leaves reduced to minute scales, as in many plants with subterranean cotyledons. These scales evidently indicate the former presence of actual leaves, which are no longer required. The curious lobing and foldings of the seed in the Walnut also remind us of the time when the cotyledons were variously lobed and folded, so as to occupy the whole space in the gradually enlarging seed. At present they seem to fulfil no useful functions.

(2.) "On the shape of the Oak-leaf." In the case of the Oak, we are so accustomed to the form of its leaf that it does not strike us as anything peculiar, and comparatively few persons, probably, ask themselves why it should be as it is. And yet it is peculiar, unlike that of any of our forest trees, or those of the Evergreen Oak, so abundant in hotter countries. In botanical phraseology, the Oak-leaves are deciduous, oblong-lanceolate, or oblong-elliptical, sinuated with blunt lobes extending not more than half-way down to the midrib. The sinus between the lobes is generally rounded off at the bottom. Again, they are rarely symmetrical, the lobes of the two sides not corresponding. The three points, then, which give the Oak-leaf its peculiar form are:—(1) the deep, rounded sinuses; (2) the want of symmetry of the two sides; (3) the oblong or oblanceolate outline. I do not know of any attempt to explain this peculiar form. That which I would suggest is as follows:—The leaves of the Evergreen Oak are entire, and small in comparison with those of the English Oak. During the winter and early spring they are protected by a series of brown scales, inside which they lie, and with which they form the well-known buds so familiar to us, and which are both small and short in proportion to the size of the leaves themselves. In cooler and moister regions, on the contrary, there is, as we know, a tendency for leaves to become larger and deciduous. These influences do not, however, affect the outer scales, which remain as before, without any increase of size. But as the leaves have increased in size, and the scales have not, the leaves can no longer retain their original arrangement in the bud. If, for instance, we compare the buds of the Oak and of the Beech, we see that while the leaf of the Oak is longer than that of the Beech, the bud of the Oak is, on the contrary, shorter than that of the Beech. Under these circumstances, what must happen? The leaf grows, and becomes longer than the bud. It is, therefore, necessarily bent into a curve. But an entire leaf, if thus thrown into a curve, would necessarily fall into folds, the number being determined by the number of ribs or veins. For such folds, however, there would be no room within the narrow limits of a bud, or rather, perhaps, they would be inconvenient, because they leave more or less empty spaces. This may be rendered more clear by taking a piece of cloth or of paper, folding it up, and then throwing it into a curve. It will then necessarily fall into one or more folds. In the membrane it is flat when the midrib is bent; then, when the midrib is extended, intervals must occur. If the membrane were strengthened, as an Oak-leaf is, by three or four side-ribs, there would be a fold between each two ribs. As a matter of fact, however, from the absence of space the membrane where the fold would be is not actually developed. We may imitate this by removing them. If this be done, the result will be the formation of sinuses rounded at the base, closely resembling those so characteristic of the Oak-leaf. These sinuses are due, then, as I believe, to the curvature of the leaf, owing to the shortness of the bud in comparison with the length of the leaf open out. Moreover, the young leaf is not only curved, it is wrapped round the interior leaves. The result of this is that one side of the leaf is folded within the other; the one, therefore, being on the outer side, has more space than the other. The two sides of the leaf are in fact differently situated, and this, I believe, accounts for the second point—namely, the want of symmetry. The oblong form is an advantage, from the way the leaves diverge from the stalk. In this manner the interesting peculiarities of the Oak-leaf may be accounted for.

(3.) "On the Leaves of *Viburnum*." We have in this country two species of Guelder Rose—*Viburnum*. They are nearly allied, but the leaves are very dissimilar, those of *V. Lantana* being oval or ovate, and, when young, very hairy; those of *V. Opulus* three-lobed, smooth, and provided with stipuliform appendages. These differences are very interesting, but no one has ever attempted to explain them. The young leaves of *V. Lantana* are sufficiently protected by their hairy covering, and are consequently left bare. This is not the case with *V. Opulus*, in which the leaves are glabrous. The outer leaves, however, become tough and leathery, and form a covering within which the other or true leaves are developed. To economise space, these leaves are folded more or less like a fan, in the same manner as those of Maples, Sycamores, Planes, &c., and this gives them their lobed form. As regards the stipuliform appendages, the genus contains some fifty species, of which about forty have oval leaves without appendages, while the remainder have lobed leaves with appendages. The presence of these appendages seems, therefore, to go with that of the lobes. I believe that they assume that peculiar thread-like form so as to fill up a space which would otherwise be left empty in the bud. Maples have no stipules, but in them the younger leaves in the bud just fill up the interspaces left between the older ones. In the lobed-leaved Guelder Roses this is not the case, but a space remains, which is just occupied by the stipuliform appendages.

(4.) "On the Presence and Functions of Stipules." Vaucher, in his 'Histoire Physiologique des Plantes,' speaking of *Helianthemum*, says:—"J'indique dans ce genre deux principaux objets de recherche. Le premier est la raison pour laquelle certaines espèces ont des stipules, tandis que d'autres en sont privées." No one, however, so far as I know, has yet attempted to answer this question, which, however, is one of considerable interest, and might be asked with reference to several other groups besides the genus *Helianthemum*. In attempting to answer this question, we may begin by considering the function or functions which stipules perform. Of these, the primary purpose is to protect the bud. In others they serve as accessory, or deputy, leaves. As an illustration of the former may be mentioned some species of *Viola;* of the latter, certain species of *Lathyrus*—for instance, *L. Nissolia*. The question may further be asked, What is the advantage to the plant in having the purpose of the leaves fulfilled by stipules instead of true leaves? Now, *L. Nissolia* is a species which lives among grass. Here, then, the same considerations which render it an advantage to grasses to have long leaves affect equally the *Lathyrus*. Again, if, when so growing, the leaves of *L. Nissolia* had resembled those of most other *Lathyrus*, they would, perhaps, have been dangerously conspicuous. The similarity of the stipules to the leaves of grasses by which they are surrounded perhaps enables them to escape observation, and to avoid being eaten. It may, indeed, be asked why the leaflets should not have assumed the long linear outline. But, even so, if they had been arranged at right angles to the petiole, the plant would have been much less grass-like, and consequently much more conspicuous than is now the case. This may, I think, be the reason which has led to the replacement of leaves by stipules in this species, and to the peculiar form which the latter have assumed. Passing on now to the cases in which the stipules serve to protect the young leaves, I may first mention in passing those instances in which the stipules with this object have become stiff, pointed, or thorn-like, as in *Robinia*. In far more numerous species, however, the stipules protect by enveloping the young bud and leaves. In such groups the view that the function of the stipules is mainly to protect the young leaf is confirmed, not to say proved, by the fact that they are very short-lived, and drop off as soon as the young leaves have expanded. Such cases are so numerous that it is hardly necessary to quote any illustrations. Indeed, in many of the lesser-known genera this early fall of the stipules leaves it doubtful whether they occur or not. On the other hand, there are cases in which protective stipules are even more persistent than the leaves to which they belong. In such cases, however, they protect, not their own leaf, but that of the following year. In the species of *Helianthemum* which have no stipules, the bases of the petioles are dilated, and protect the young buds; while in those species which have stipules the petioles are not dilated, but are even narrowed towards the base. The same rule applies in other groups also, and I conclude, therefore, that the presence or absence of petioles in such species has reference to the protection of the buds, this being in some sense effected by the stipules, in others by the dilated bases of the petioles.

March 6.—Mr. W. Carruthers, F.R.S., President, in the chair. —Mr. S. Lithgow was admitted, and Messrs. J. Lowe, E. R. Waite, and G. F. Elliott were elected Fellows of the Society.—A paper was read by Mr. D. Morris "On the Production of Seed in certain Varieties of the Sugar-cane, *Saccharum officinarum*." It was pointed out that, although well known as a cultivated plant, the Sugar-cane had nowhere been found wild; nor had the seed (*caryopsis*) been figured or described, it being the generally-received opinion that, having been propagated entirely by slips or cuttings, it had lost the power of producing seed. Spikelets, however, received at Kew had been carefully examined, and the seed found, which was now for the first time exhibited by Mr. Morris. He anticipated that by cross-fertilization and selection of seedlings the Sugar-cane might be greatly improved, and much importance was attached to the subject as it opened up a new field of investigation in regard to Sugar-cane cultivation. — A paper was read by Mr. Spencer Moore "On the true nature of Callus. Part I. The Vegetable Marrow and *Ballia callitricha*." It was shown that the callus of sieve-tubes of the Vegetable Marrow gives marked proteid reactions, and since it is dissolved in a peptonising fluid, there can be no doubt of its being a true proteid, and not a kind of starchy mucilage, as is usually supposed. The "stoppers" of *Ballia* also yield proteid reactions, but inasmuch as they resist gastric digestion, the substance cannot be a true proteid, and may perhaps be allied to lardacein. Mr. Moore maintained the view of Russow, Strassburger, and others, that callus is deposited upon the sieve to be correct in the case of the Vegetable Marrow; since a peptonising fluid clears the sieve-plates, and leaves them in their pristine condition, which would not be the case if callus were formed by a swelling-up of the sieves. A discussion followed, in which Dr. F. W. Oliver, Dr. D. H. Scott, Prof. Reynolds Green, and Mr. George Murray took part.

March 20.—Mr. W. Carruthers, F.R.S., President, in the chair. —Mr. G. F. Scott Elliott was admitted and Mr. H. E. Milner elected a Fellow of the Society. — The papers read were entirely zoological.

NOTES ON ENGLISH RUBI.

By W. O. Focke, M.D.

(Concluded from p. 103.)

15. R. leucandrus Focke.—Under this species I put a bramble which I saw near West Moors and Daggons, Dorset. The stems are hairy and growing in a high arch, the leaflets pale green and pubescent below, the terminal one ovate or somewhat cordate. The panicle is of moderate size, generally racemose at the top. Rachis and peduncles villous, with a few small prickles. Flowers rather large, white. Sepals reflexed.

Cont. distrib. N.W. Germany; at many places abundant.

16. R. villicaulis Koehl. *R. calvatus* Blox. — The name is a misleading one, because the stems of the plant are by no means very hairy. It has been given in Silesia, a country where all the other robust brambles have glabrous stems. A dry specimen of *R. calvatus* Blox., received from Mr. Bloxam himself, is by no means different from *R. villicaulis.* The Villicaulis-type comprehends several remarkable varieties, but it is even more difficult to keep them distinct than in the case of *R. rhamnifolius.* The plant I saw with Mr. Rogers near Bournemouth (Branksome, West Moors, Gore Heath, Daggons, Buckland) agrees very well, except in the length of the stamens, with a variety common in N.W. Germany. In the Dorset plant the stamens do not exceed the styles, as is the case in the German varieties. A few glandular setæ in the panicle of *R. villicaulis* are of frequent occurrence.

Cont. distrib. S. Sweden, Denmark, Germany (disappearing in the southern parts), Belgium, N. France.

17. ? R. rotundatus P. J. Muell. — Genevier's description of *R. rotundatus* agrees perfectly with a bramble I saw at several places in Cornwall and S. Devon. Many years ago Mr. Briggs sent me dried specimens asking a name for it. The plant is very remarkable from its long slender prickles and large milk-white petals. It is near *R. incurvatus*, which may be, however, distinguished by its shorter prickles, smaller pink flowers, and long narrow panicle. I have seen no French specimens of *R. rotundatus*, and therefore I am not quite sure about the correctness of the name. The plant will be found in several localities of western England. I saw it near the Lizard, Cornwall, and near Plymouth (Shaugh, Bickleigh). Mr. Briggs collected it near Pokesdown, S. Hants, and the Rev. W. R. Linton has sent me a specimen from Shirley, Derbyshire.

Cont. distrib. of *R. rotundatus:* France.

III. *Stems arcuate-prostrate, bearing equal strong prickles and adpressed hairs. No glandular setæ.*

18. R. rusticanus Mercier. *R. discolor* W. Exsicc. non W. et N. Rub. Germ. — The earliest name would be *R. ulmifolius*

Schott, which perhaps may be used in a more aggregate sense. General in England.

Cont. distrib. Germany (very local near the western frontier), Netherlands (southern part), Belgium, France, S. W. Switzerland, the whole of the Mediterranean region. It occurs in Madeira and the Azores.

IV. *Stems arcuate-prostrate, bearing equal or nearly equal prickles of moderate size and patent dense hairs, but generally without glandular setæ, which occur, however, in many cases in the panicle.*

19. R. SILVATICUS W. et N. — Remarkable by its frequent short but rather strong prickles on the stem, quinate leaves green on both sides, a dense panicle bearing very small prickles but no glandular setæ, white flowers and stamens longer than the styles. Mr. Briggs showed me, near Plymouth, a bramble he supposed to be *R. silvaticus* W. et N., and I think it agrees very well with that species.

Cont. distrib. N. W. Germany.

20. R. MACROPHYLLUS W. et N. — Stems usually very long and thick, leaves and panicles often very large, the flowers, however, of a moderate size and not conspicuous. Terminal leaflet long-stalked, cordate-ovate, gradually tapering into a long point. A wood plant. I have seen it in Dorset (Branksome Chine, and Daggons) and S. Devon (Fursdon, Egg Buckland). Mr. Briggs knows it from different places near Plymouth.

Cont. distrib. Germany, Austria, W. Hungary, France. Near the shores of the Baltic it occurs as far eastward as Kahlberg between Kœnigsberg and Danzig. Professor Clavaud has sent me the same plant from the neighbourhood of Bordeaux. Its area therefore is a very large one.

21. R. MICANS Gren. et Godr. *R. adscitus* Genev.; *R. hypoleucus* Lefv. et Muell.—Frequent around Plymouth. Mr. Briggs informs me that he has seen it near Colwall Heath, Isle of Wight.

Cont. distrib. France.

? R. Questierii P. J. Muell.—The leaves of this species are green on both sides; the sepals, however, and the peduncles are white-felted. This species is common in Western France, and it occurs on the Isle of Jersey; therefore it may be expected in Southern England. Mr. Charles Bailey has kindly sent me a specimen collected by him on the Charmouth Road near Lyme Regis, Dorset, which very much recalls *R. Questierii.*

Cont. distrib. France.

22. R. RAMOSUS Blox. (?). — I have some doubts about the identity of the well-known *R. ramosus* from Devonshire and the original plant distinguished by Bloxam. With Mr. Briggs I saw "*ramosus*" at several places near Plymouth. It is cultivated at Kew, but I do not remember under what name.

Cont. distrib. Unknown.

23. R. SPRENGELII W. *R. Borreri* Bell Salt. — I have not seen

the living plant in England, but numerous dried English specimens.

Cont. distrib. Denmark, N.W. and C. Germany, N. France.

24. R. PULCHERRIMUS Neuman. *R. polyanthemos* Lindeg.—Mr. Baker puts it under *R. umbrosus* Aut. Anglor. as a glandular variety. This view may be correct, as the differences seem to be of little importance. I know, however, no intermediate forms. I have not seen the living plant, but I have received dried specimens from different parts of England.

Cont. distrib. S. Sweden, Denmark, Germany (very local).

25. R. MACROTHYRSOS Lange.—Mr. Griffith and Mr. Bailey have sent me specimens of this beautiful bramble from N.W. Wales.

Cont. distrib. Very local in N.W. Germany (Holstein, Hartz Mount.) and N. France (Oise, Seine Inf.; see Assoc. Rubol. 430, 631).

26. R. PYRAMIDALIS Kaltnb.—In general appearance it resembles *R. villicaulis* (*calvatus*), but it is distinguished by smaller prickles, a very soft, nearly velvety under side of the leaves, a dense and always glandular panicle, &c. I have seen a good deal of dried English specimens.

Cont. distrib. S. Sweden, Denmark, N. and W. Germany, Belgium, N. France.

27. R. VESTITUS W. et N. *R. leucostachys* Schleich.—In such genera as *Rubus* it is nearly impossible to follow in every case the rules of priority. We cannot choose the first name, if its meaning is not quite clear and correct. The first description of a bramble is often very incomplete or erroneous, or it combines different forms or separates allied ones. The name of "*leucostachys*" or "white spike" shows that the author did not include the ordinary pink-flowering form. On the other hand, the description of *R. vestitus* given by Weihe et Nees is very accurate; the authors have studied the influence of soil and moisture upon the plant, they have pointed out under what circumstances this species will produce pink or white flowers, orbicular or elliptic leaflets with a white or a green under surface. Therefore, I think we shall do better to prefer the name *R. vestitus*, published a few months later, than *leucostachys*, for the same reasons as we prefer *R. suberectus* to *Nessensis* and *rosaceus* to *heteracanthus*. I have seen *R. vestitus* at many places in S. England.

Cont. distrib. Denmark, W. Germany, Belgium, Switzerland, Austria (very local), France.

V. *Stems arcuate-prostrate, bearing prickles of nearly equal size and glandular setæ or small prickles. No intermediate aciculi and bristles.*

a. *Glandular setæ scattered or confined to the lower part of the barren stem.*

28. R. BORÆANUS Genev.—Not rare around Plymouth, where I saw it with Mr. Briggs at different places (Egg Buckland, Bickleigh, &c.).

Cont. distrib. W. France.

29. R. Lejeunei W. et N. — I have seen dried specimens only, gathered by Mr. Briggs near Plymouth. Mr. James W. White has sent me a specimen of a very hairy variety he has collected on the Hobbie Walk, Clovelly, N. Devon.

Cont. distrib. W. Germany, local near the Belgian frontier; Belgium, France, N.W. Italy.

30. R. mucronatus Blox. — I have seen it with Mr. Rogers at several places around Bournemouth in S. Hants and Dorset. The Plymouth plant having usually ternate leaves is somewhat different. It happened that a continental botanist found hairy anthers in the flowers of the first English specimen of *R. mucronatus* he ever examined. This observation was sufficient for him to think a German plant, determined by me as *R. mucronatus*, might be different, and must receive a new name; therefore he called it *R. atrichantherus*, or "bramble with hairless anthers." If we were to adopt this view nearly all our English *R. mucronatus* would have to be considered as *R. atrichantherus.* From this example we can learn how to make new species.

Cont. distrib. N. Germany (district between the German Sea and the Baltic); France.

31. R. infestus W. et N. — I have seen dried specimens from different parts of England.

Cont. distrib. S. Sweden; Denmark (local); N.W. Germany.

b. *The whole stems rough from frequent setæ.*

32. R. echinatus Lindl. *R. rudis* Babgt. prius.—I have seen it with Mr. Rogers and Mr. Briggs near Daggons, Dorset, and near Buckland, S. Hants. *R. discerptus* P. J. Muell., I suppose, will prove to be the same plant.

Cont. distrib. W. Germany ?, France.

33. R. radula W.—Frequent around Bournemouth. The plant growing in this part of England is somewhat different in general appearance from the German type, but it cannot be considered as a well-marked variety. Further, I have seen *R. radula* near Plymouth.

Cont. distrib. S. Sweden, Denmark, Germany, W. Austria, Switzerland, N. France.

34. R. rudis W. et N. — Stems usually quite hairless. Rachis and branches of the spreading panicle covered with a thin close felt. Glandular setæ abundant but short. I have received a dried specimen from Walton-on-Hill Heath, Surrey, collected by Mr. W. H. Beeby.

Cont. distrib. W. and E. Germany, Austria (local), Switzerland, France.

35. R. anglosaxonicus Gelert. — I collected this bramble with Mr. Rogers at Milton, S. Hants, near the station. According to Mr. Gelert it is cultivated at Copenhagen from seeds sent from Plymouth under the name of *R. macrophyllus.*

Cont. distrib. N.W. Germany (local), France.

36. R. MELANODERMIS. — This name may be provisionally given to the bramble determined by Prof. Babington as *melanoxylon* (*vide* Journ. Bot. 1887, pp. 21, 22). The true *R. melanoxylon* Muell. et Wirtg. resembles a weak glabrous *R. villicaulis* (*calvatus*) bearing some glandular setæ. The *R. melanodermis*, however, is a small, low, and very glandular bramble. It may be a variety of Wirtgen's plant, but at present I do not venture to pronounce a certain opinion. I have seen *R. melanodermis* with Mr. Rogers at Branksome and West Moors, Dorset; and at Milton, S. Hants. A dried specimen gathered near Shirley, Derbyshire, by the Rev. W. R. Linton approaches somewhat more the true *R. melanoxylon.*

Cont. distrib. of *R. melanoxylon.* W. Germany, France.

37. R. FUSCUS W. et N. — I collected this species with Mr. Rogers at Milton, and near Sway, S. Hants. A closely-allied bramble seems to be more frequent in England than the true *R. fuscus.* It has broader leaflets than this species, and the sepals embrace the fruit. I have seen it in the Leigh Woods, near Bristol, where it is abundant. Besides this variety, I have received from different parts of England dried specimens resembling *R. fuscus*, but more or less anomalous.

Cont. distrib. of the true *R. fuscus.* W. Germany, N.E. France.

38. R. PALLIDUS W. et N. (not of English authors). — Rare in England. I possess a specimen gathered by the Rev. E. F. Linton near Sprowston, Norfolk.

Cont. distrib. Denmark, N.W. Germany, N.E. France.

39. R. SCABER W. et N.—Bickleigh Vale, near Plymouth, where I collected this species with Mr. Briggs.

Cont. distrib. Germany (very local), France.

40. R. LONGITHYRSIGER Lees. *R. pyramidalis* Bab. — Seen with Mr. Briggs near Plymbridge and several other places in S. Devon.

Cont. distrib. Unknown.

41. R. FOLIOSUS W. et N. *R. Guentheri* Bab. prius. *R. flexuosus* P. J. Muell. 1859 (non Lejeune, 1824). *R. derasus* Lefv. et Muell. *R. saltuum* Focke. — Seen between Lymington and Sway, S. Hants; Daggons, Dorset; Bickleigh Vale, Devon. Besides the patent hairs on the branches of *R. flexuosus*, I have failed to detect any differences between Mueller's description of this species and that of *R. derasus.* My *R. saltuum* agrees exactly, except in the colour, with either description. *R. flexuosus* and *derasus* are said to have whitish or pale pink petals, and green styles; in the typical *R. foliosus* the styles are green, and the petals white; in my *R. saltuum* the styles red, and the petals pink. Mueller and Genevier would have thought these differences to be sufficient for the establishment of specific distinction. I believe that the weak, pink-flowering *R. saltuum* is the product of a sandy soil or granitic rocks. The white-flowering varieties are generally stronger, and occur in a soil mixed with clay and a little limestone.

Cont. distrib. W. Germany, Switzerland, France.

VI. *Stems arcuate-prostrate or quite prostrate, bearing prickles, aciculi, and glandular setæ of different sizes. Basal leaflets stalked.*

A. *Intermediate aciculi scattered.*

42. R. MUTABILIS Genev.—Frequent around Plymouth, where I saw it with Mr. Briggs.

Cont. distrib. W. France.

43. R. BLOXAMII Lees. — Frequent around Bournemouth, in S. Hants, and Dorset. It is closely allied to *R. thyrsiflorus* W. et N., and perhaps the two species may run together.

Cont. distrib. According to Genevier, W. France.

44. R. ROSACEUS W. et N.—I have seen dried English specimens only, but from different parts of the country.

Cont. distrib. N.W. Germany, Belgium, France (following French authors, I have seen no French specimens).

B. *Prickles, aciculi, and setæ of every size mixed.*

45. R. HYSTRIX W. et N. — In dry specimens it is difficult to trace the limits between this species and *R. Koehleri.* I have not seen living plants of either species in England.

Cont. distrib. N.W. Germany (very local !).

46. R. KOEHLERI W. et N.—See *R. hystrix.*

Cont. distrib. The typical plant occurs frequently in the central part of Germany, from the Russian to the Belgian frontier. Varieties or nearly-allied forms are spread over the whole of Central Europe. A small variety is *R. Reuteri* Merc.

47. R. VIRIDIS Kaltenb. *R. pallidus* of many English authors.—It is easily distinguishable from the true *R. pallidus* by the abundant intermediate aciculi on the stem and the rachis. Mr. Briggs showed me a plant near *R. viridis* in the Common Wood, Bickleigh, S. Devon.

Cont. distrib. W. Germany.

48. R. HIRTUS W. K. (aggregate). — In S. Devon I have seen several forms of this group. It would be a useless attempt to arrange these English plants under one or the other continental subspecies or varieties.

Cont. distrib. of the *hirtus* group. Western, Central, and Southern Europe; Asia Minor.

VII. *Stems arcuate-prostrate or quite prostrate, armed in a various manner. Basal leaflets nearly sessile.*

A. *Prickles, aciculi, and setæ unequal and very abundant.*

49. R. DIVERSIFOLIUS Lindl. — Seen at different places in S. Hants and Dorset, near Bournemouth; Fursdon, S. Devon. Resembles *R. Koehleri*, but I think it is nearer the Corylifolian group. The *R. dumetorum ferox* W. is not quite the same, but I think my *R. myriacanthus* will fall under *R. diversifolius.*

Cont. distrib. N.W. Germany (*R. myriacanthus*).

B. *Aciculi and setæ scattered, or none.*

50. R. Balfourianus Blox. — Seen with Mr. Rogers at Milton and Buckland, S. Hants. Near Plymouth I have seen a similar bramble.

Cont. distrib. W. France.

51. R. corylifolius Sm.—I saw several varieties of it at Milton, S. Hants; and near West Moors, Gore Heath, and Daggons, Dorset.

Nearly allied variable forms occur on the Continent.

52. R. cæsius L.—As far as I remember, I have seen no living true *R. cæsius* in England. I know the English plant from dried specimens.

Cont. distrib. Nearly the whole of Europe, except the subarctic and the most southern parts; N.W. Asia.

Finally, I may say a few words about *R. pubescens* W. et N. I have seen in England several forms, which I supposed at first sight to be varieties of that species. Every single shrub, however, thought to be near *pubescens* or near *thyrsoideus* was not only somewhat different from the continental types, but it could not be exactly identified with any other similar English plant. Every single bush I saw had its own appearance, its own characters. Therefore I cannot believe that these individual forms represent a true natural species; they may be the modified offspring of some natural hybrids. I have not mentioned such species as *R. incurvatus* Bab., *R. Colemanni* Blox., and *R. fusco-ater* W. et N., because I had no opportunity of examining them in a satisfactory manner. The two first-named species are unknown on the Continent, and the third is not yet very well defined, and requires further research. The same difficulty exists in a group of forms, like *R. Salteri* and *R. hirtifolius*, intermediate between *R. villicaulis* and *R. pyramidalis* Kaltenb. On the other hand, I know several unnamed or provisionally named English brambles, which, I think, represent well-marked species; they must be studied more accurately than can be done in a short visit. My own impression is that the knowledge of our indigenous brambles has advanced very much since the time when Prof. Babington's standard book appeared. That knowledge is, however, far from being satisfactory, and I trust a continued study will reveal interesting facts.

THE GENUS *SCAPHOSEPALUM* Pfitzer.

By R. Allen Rolfe, A.L.S.

There is a curious little group of Orchids, comprising about nine known species, which have presented some difficulty to botanists. The first known was described as *Masdevallia verrucosa* Rchb. f., in 1849, but five years later the same author transferred it to *Pleurothallis*, where it was retained by Lindley in his monograph of that genus, in 'Folia Orchidacea.' In 1855 a second species appeared, and Reichenbach reverted to his earlier opinion, and called it *Masdevallia ochthodes*: and successive species have been described under *Masdevallia*. Of the correctness of this view I have long felt a doubt, on account of certain anomalous characters, which do not altogether correspond with either of the two genera. The character which separates *Masdevallia* from *Pleurothallis* is that in the former the base of the dorsal sepal is united with the lateral pair to form a tube, of variable length in the different species, while in the latter there is no such union, consequently no tube. There is no other character which applies to all the species that can be relied upon to separate the two genera.

The remarkable amount of uniformity which prevails throughout the very numerous species of these two genera does not altogether apply to the little group in question, which Professor Pfitzer now proposes to separate, under the name *Scaphosepalum* (Engler and Prantl., 'Natürliche Pflanzenfamilien,' vol. i., Orchidaceæ, p. 139), in allusion to the scooped-out or boat-like arrangement of the united pair of lateral sepals. The following are its essential characters:—The flowers are invariably inverted as compared with the two genera named—that is, the lateral sepals and the lip are invariably uppermost, while the odd sepal and the column are underneath. The dorsal sepal is either free or so nearly so that the union is barely perceptible; while the lateral pair are united for some distance into a curiously curved and concave body, and then sharply turned outwards into a pair of diverging tails, which differ greatly in shape in the different species. The lip is a very curiously curved and crumpled body, which is not easily described in a few words, but, like the other characters named, totally unlike anything seen in either *Pleurothallis* or *Masdevallia*. In short, *Scaphosepalum* differs more from either of these two genera than they do from each other, and therefore I think its separation fully justified. The exclusion of this group from *Masdevallia* leaves that genus far more homogeneous in character, as well as more strictly separable from *Pleurothallis*. I now think that the anomalous species I described some time ago (Gard. Chron. 1888, pt. 2, p. 178) as *Masdevallia platyrhachis* must be referred to *Pleurothallis*.

The following are the species:—

1. S. ANCHORIFERUM. *Masdevallia anchorifera* Rchb. f., in Gard. Chron., 1884, i. p. 577.—Costa Rica. It is allied to *S. ochthodes*.

2. S. BREVE. *Masdevallia brevis* Rchb. f., in Gard. Chron., 1883, ii. p. 588.—British Guiana, Roraima district. Allied to the preceding species and *S. macrodactylum*.

3. S. GIBBEROSUM. *Masdevallia gibberosa* Rchb. f., in Gard. Chron., 1876, i. p. 8; Bot. Mag., t. 6990.—New Granada.

4. S. MACRODACTYLUM. *Masdevallia macrodactyla* Rchb. f., in Gard. Chron., 1872, p. 571.—New Granada.

5. S. OCHTHODES Pfitz., in Engl. and Prantl., Natürl. Pflanzenfam., i. Orch. p. 139. *Masdevallia ochthodes* Rchb. f., in Bonplandia, iii. (1855), p. 70.—New Granada, discovered by Wagener, near San Pedro and Turmero, at an altitude of 6000 feet.

6. S. PULVINARE. *Masdevallia pulvinaris* Rchb. f., in Gard. Chron., 1880, i. p. 200.—Columbia?

7. S. PUNCTATUM. *Masdevallia punctata* Rolfe, in Gard. Chron., 1888, ii. p. 323. — New Granada? Closely allied to *S. swertiæfolium*.

8. S. SWERTIÆFOLIUM. *Masdevallia swertiæfolia* Rchb. f., in Gard. Chron., 1880, ii. p. 390. Discovered by Lehmann on the Western Cordillera of New Granada.

9. S. VERRUCOSUM Pfitzer, in Engl. and Prantl., Natürl. Pflanzenfam., i. Orch. p. 139. *Masdevallia verrucosa* Rchb. f., in Linnæa, xxii. (1849), p. 819. *Pleurothallis verrucosa* Rchb. f., in Bonplandia, ii. (1854) p. 24.—New Granada, near La Baja, in the province of Pamplona, at 8200 feet elevation, Funck and Schlim, No. 1439.

NOTES ON PONDWEEDS.

By Alfred Fryer.

POTAMOGETON DECIPIENS Nolte. —*Rootstock* striking deeply into the soil with strong far-spreading stolons; *stem* stout, round, simple below, sparingly branched above the middle; all the branches spreading ultimately at the surface of the water, with widely diverging branchlets. *Leaves all submerged, semi-amplexicaul, or upper sessile;* alternate, opposite at the base of the peduncles only; *lowest leaf* very rarely reduced to a short strap-shaped phyllode which is rounded at the tip and mucronate, or with a narrow lamina attenuated towards each end. Ordinary leaves all similar, oblong, strap-shaped, rounded and mucronate at the apex, or narrowed and apiculate, upper rarely orbicular, flat, or involute at the base, sometimes longitudinally folded and recurved, with 3 principal ribs on each side of the midrib, *the two outer springing from the base of the leaf, the inner from the midrib itself*, with fainter intermediate ribs connected by numerous conspicuous transverse veins. *Stipules* blunt, stout, long; those on the upper branchlets longer than the internodes; herbaceous, persistent; those at the base of the stem sometimes dilated towards the tip into a leaf-like lobe, *those at the base of the branches often bearing a conspicuous sessile leaf* 1–2 *in. long*. *Peduncles* not swollen upwards, often scarcely thicker than the stem; 2–3 times longer than the flower-spike, subtended by two opposite leaves, terminal becoming lateral by the growth of the branch. *Flower-spike* 1 in. long, *barren; abortive drupelets resembling those of P. perfoliatus.* Colour of the whole plant bright green, or brownish green, drying darker.

P. decipiens, as at present accepted by authors, is probably not a true species, but an aggregate of hybrids between *P. lucens* (female) and *P. perfoliatus* (male), or possibly sometimes with *P. Zizii* as the seed-bearing parent. It is very closely related to the larger forms of *P. nitens*, such as f. *prælongifolia* of Dr. Tiselius. Some botanists have suggested that it is *lucens* × *prælongus*, but this view is not supported by its local distribution, nor by its leaf-structure and habit of growth, which latter is that of *P. perfoliatus*. This origin is also rendered highly improbable by the early flowering of *P. prælongus*, which is usually in fruit by the time the first flowers of *P. lucens* begin to expand.

Although mature fruit of *P. decipiens* is never produced, yet isolated plants which are apparently seedlings are not unfrequently found in remote localities, to which it is almost impossible that offsets of living plants could be carried by natural means. In these situations a single plant only is usually found, which often presents some slight individual peculiarity sufficient to distinguish it alike from the type, or from other local forms. These plants are always found growing with the supposed parents; I have never met with them in localities where *lucens* and *perfoliatus* were not present. In waters where *P. decipiens* grows more abundantly it occupies large spaces or beds, evidently by the extension of the strong-growing rootstock; each of these beds is composed of plants which do not vary year after year, but it will often happen that three or four beds, each tenanted by a slightly differing variety, occur in the space of a few yards, too near for local causes to produce variation, and yet so constantly distinct as to induce the belief that each bed of plants is the produce of a different seed. Under cultivation, as far as I have been able to observe, local forms of *P. decipiens* remain very constant, which is not the case with those of some species of *Potamogeton*. Although these facts are not conclusive proofs of a hybrid origin for *P. decipiens*, they present an accumulated weight of evidence which is difficult to rebut.

Before I thoroughly knew this plant I frequently passed it over in its early states as *P. lucens*, or when in flower as *P. perfoliatus*. It resembles the latter species in the *lower stipules* expanded into ear-like leaves towards the tip, and in the lower leaves, which are *narrow and slightly stalked in both species*, although rarely present in this state. The alliances, and probably the origin, of the species of *Potamogeton* must be sought in their early stages, which often present features which entirely disappear with the growth of the plant. Thus stipules with adnate leaves are frequently met with on young stems of most species of *Potamogeton*, while in *P. pectinatus*, belonging to a group characterised by adnate leaves, the lower leaf is often merely sessile!

I am indebted to Dr. Tiselius, of Stockholm, for a very beautiful series of Swedish forms of *P. decipiens*, and he expresses a very decided opinion that this species is the same as *P. salicifolius* of Wolfgang, of which he possesses an original specimen which agrees in all respects with a form named by him *P. upsaliensis*. Dr. Tiselius labels a plant which is exactly like our fenland *decipiens*,

"POTAMOGETON UPSALIENSIS Mihi.
= *salicifolius* Wolfg.
= *lithuanicus* Gorski.
= *lanceolatus* Reich. non Sm.
Omnes formæ *P. decipientis* Nolte."

A specimen which Dr. Tiselius has also sent me, named by him "*P. salicifolius* Wolf." (and of which he says, "Hæc planta omnino est congruens cum speciminibus orig. a Wolfgang in fluvio Vilia prope Wilnam lectis"), is very like the early state of a form of *P. decipiens* from the Warwick Canal, kindly sent to me by Mr. H. Bromwich. This latter plant was distributed by the Exchange Club as "*P. decipiens* var. *affine*." It differs in some respects from the type of Nolte,* but may, I think, be placed under *P. decipiens*. Here also I would place a plant, distributed by the Rev. Augustin Ley, and named "*P. salicifolius* Wolfg." in Lond. Catalogue, ed. viii. I need hardly say that I am not in any way founding my estimate of the specific states of the Herefordshire plant on Dr. Tiselius's notes; I formed my opinion of the position of the Herefordshire plant on quite independent grounds. Indeed, I have not sufficient knowledge of the specimens and writings of the great European botanists who have written on the genus *Potamogeton* to enable me to give an opinion as to whether the plants of Wolfgang and Nolte are referable to the same specific aggregate.

Through the kindness of Professor Babington, I have been able to examine carefully and repeatedly his unique specimen of "*P. longifolius*," and I have come to the conclusion that it is certainly a *decipiens-form*, but one that is decidedly more towards *lucens* than any other I have seen. While the *leaf-structure* is that of *decipiens*, the *peduncle* and flower-spike are like those of *lucens*, but the flowers seem imperfect, and suggest that they are barren.

It may perhaps be possible for *P. decipiens* to be fertilised by the pollen of other species; but in the fens, at least, it never produces any pollen of its own whatever, the anthers being quite empty. In spite of this the flower-spikes are visited by insects and may rarely become fertilised. I am not aware that any author has pretended to describe the fruit of *P. decipiens*, although almost all have carefully described the hitherto unseen fruit of *P. nitens*! *P. decipiens* is one of the most beautiful species known, almost equalling *P. prælongus* in the colour and delicacy of its leaves. In warm summers it flowers freely, and the drupelets swell for a short time and give promise of maturity which is not fulfilled. It is rather common in the Cambridgeshire fens around Chatteris, but I have met with one patch of it only in Huntingdonshire, just within the border of the county at Earith.

Although we must almost certainly regard this plant as a hybrid, I am in favour of retaining the specific name of Nolte, at all events until its rank is definitely settled by actual experiment in cross-breeding, or by more complete observation in the field. Possibly many "species" of fertile Potamogetons are of hybrid origin; but this note is already too long, so I must reserve any further remarks on this subject for a subsequent paper.

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* I have Mr. Bromwich's plant under cultivation, and hope to make it the subject of a subsequent note when more fully observed.

SYNOPSIS OF GENERA AND SPECIES OF *MALVEÆ.*

By Edmund G. Baker, F.L.S.

(Continued from p. 18.)

Subtribus 2. Eumalveæ. — Carpella simplici serie verticillata. Ovula solitaria adscendentia.

IV. ALTHÆA* Cav. Diss. ii. p. 91.—Bracteolæ 6–9 connatæ. Receptaculum seu axis fructus carpella non superans. Styli intus longitudinaliter stigmatosi.

Sect. 1. Althæastrum. *Althæa* Linn. Gen. n. 839; DC. Prod. i. 436. — Bracteolæ sæpius 8–9. Carpella unilocularia intus processu pericarpii destituta.

* *Annuæ.*

1. Althæa hirsuta L.; DC. Prod. i. 437; Rchb. Ic. Flor. Germ. v. t. 172; Cosson et Durieu, Explor. de l'Algérie, t. 69, fig. 3; Eng. Bot. ed. 3, t. 277. — Hirsuta aspera, stipulis ovatis cuspidatis, foliis inferioribus suborbicularibus, superioribus 3–5-palmifidis, pedunculis solitariis unifloris, bracteolis lanceolatis calyce brevioribus, calycis lobis erectis lanceolatis, petalis subæquilongis, carpellis glabris rugosis margine obtusis.

Hab. South and Central Europe! Algeria! to Persia!

Stem 3 in. to 2 ft. high; bracts $\frac{1}{3}$ in.; sepals $\frac{1}{2}$ in.; petals $\frac{1}{2}$ in. long.

Var. grandiflora Ball in Journ. Bot. 1873, p. 302. *Althæa longiflora* Boiss. et Reut. Diagn. No. 13; Explor. de l'Algérie, t. 69, fig. 2.—Corolla calyce duplo longiore, carpellis dorso carinatis.

Hab. Andalusia. New Castille. Marocco! Algeria!

Petals often an inch or more long.

2. A. Ludwigii L.; DC. Prod. i. 437. *Malva malwensis* Edgew. in Hook. Journ. Bot. ii. 284. *A. gariepensis* E. Mey. in herb. Drège.—Hirsuta, caulibus prostratis, foliis orbicularibus lobatis vel 3–5-fidis lobis cuneatis, pedicellis axillaribus brevissimis, floribus congestis, bracteolis lanceolatis villosis, calycis lobis villosis, petalis calyce sublongioribus, carpellis glabris rugosis.

Hab. Punjab! Beloochistan. Persia. Cape of Good Hope! Arabia Petræa! Egypt! Sicily. Algeria! Marocco!

Leaves $\frac{2}{3}$ in.; bracts $\frac{1}{3}$ in.; sepals $\frac{1}{3}$ in.; petals $\frac{1}{3}$ in. long.

** *Perennes.*

3. A. officinalis L.; DC. Prod. i. 436; Rchb. Ic. Flor. Germ. v. t. 173; Eng. Bot. ed. 3, t. 278. — Caule erecto, stipulis lineari-lanceolatis, foliis utrinque molliter tomentosis inferioribus ovatis

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* Alefeld, in Oest. Bot. Zeit. 1862, pp. 260—261, has newly defined *Althæa*, in which he includes many well-known species of *Lavatera* and *Malva*. The synonyms thus created have not been cited by Boissier or Nyman, nor have they been adopted elsewhere; and it does not seem necessary to include them in this enumeration.

basi cordatis cuneatis vel subcordatis superioribus interdum trilobis serratis, pedunculis axillaribus multifloris folio brevioribus, bracteolis lanceolatis calyce brevioribus, sepalis triangularibus, carpellis tomentosis.

Hab. Central and Southern Europe! Algeria! Orient!

Stems 2–4 ft. high; leaves 2–3 in.; bracts $\frac{1}{4}$ in.; sepals $\frac{1}{3}$ in.; petals $\frac{1}{2}$–$\frac{2}{3}$ in. long.

Subsp. 1. A. INDICA = *A. officinalis* var. *taurinensis* Mast. in Fl. Brit. Ind. i. p. 319, non DC. — Foliis leviter tomentosis, pedunculis axillaribus brevibus paucifloris.

Hab. Kashmir!

Subsp. 2. A. TAURINENSIS DC. Prod. i. 436; Rchb. Ic. Flor. Germ. v. t. 174. *A. officinalis β*. Willd. Sp. 3, p. 771. — Foliis utrinque molliter tomentosis, pedunculis axillaribus paucifloris folio sublongioribus, bracteolis acuminatis.

Hab. Italy! Dalmatia!

4. A. ARMENAICA Ten. Ind. Hort. Neap. 1837. *A. taurinensis* C. A. Mey. Ind. Cauc. p. 207, non DC. *A. multiflora* Rchb. Ic. Flor. Germ. v. t. 174. — Caule erecto, foliis tenuiter tomentosis inferioribus palmatipartitis superioribus tripartitis, pedunculis axillaribus congestis plurifloris folio æquilongis vel longioribus, bracteolis lanceolatis, sepalis ovatis acuminatis, petalis cuneiformibus retusis, carpellis stellatim hirtulis dorso rugosis.

Hab. Servia! Hungary. Cappadocia. Syria. Armenia. Turkestan! Western and Central Siberia!

Stem 2–3 ft. high; leaves 2 in. long; bracts $\frac{1}{6}$ in.; sepals $\frac{1}{3}$ in.; petals $\frac{1}{2}$ in. long.

5. A. CANNABINA L.; DC. Prod. i. 436; Rchb. Ic. Flor. Germ. v. t. 173. *A. Kotschyi* Boiss. Diagn. Ser. 2, i. p. 102. — Caule erecto, stipulis lineari-lanceolatis, foliis 3–5-palmatifidis vel ovatis lobatisque tomentosis serratis, pedunculis axillaribus 1–∞-floris folio longioribus, bracteolis calyce brevioribus, calycis lobis oblongis cuspidatis, carpellis glabris dorso rugosis.

Hab. From Spain! and France! to Persia!

Stem 2–5 ft. high; leaves 2 in.; bracts $\frac{1}{5}$ in.; sepals $\frac{1}{4}$ in.; petals $\frac{2}{3}$ in. long.

Subsp. A. NARBONENSIS Pourr.; DC. Prod. i. 436; Jacq. Ic. Pl. t. 138. — Foliis inferioribus palmatilobatis, floribus carpellisque minoribus.

Hab. South France! Italy! Spain!

Sect. 2. ALCEA Linn. Gen. n. 840. — Bracteolæ 6 (raro 7–9). Carpella subbilocularia processu interno pericarpii.

**Apterocarpæ* Boiss. Fl. Or. i. 826. — Carpelli dorsum planum vel canaliculatum marginibus obtusis acutis vel obsoletis nec in alam membranaceam expansis.

6. A. AUCHERI Boiss. Diagn. Ser. 1, vi. p. 28. *Alcea Aucheri* Boiss. Fl. Or. i. 826.—Caule leproso humili ramoso, foliis pannosis

crassis ovatis vel ovato-lanceolatis interdum lobatis basi subcordatis, pedunculis calyce longioribus petiolo brevioribus, bracteolis lineari-lanceolatis calyce triplo brevioribus, sepalis ovatis acutis, petalis roseis, carpellis hirtis transverse rugosis margine acutis.

Hab. Central and Southern Persia! Afghanistan!

Stem 1 ft. long; leaves $2\frac{1}{4}$ in. long, $1\frac{3}{4}$ in. broad; petiole sometimes 2 in.; bracts $\frac{1}{2}$ in.; sepals $\frac{2}{3}$ in.; petals $1\frac{1}{4}$ in. long. Easily recognised by thick indumentum and narrow lanceolate bracts.

7. A. SULPHUREA Boiss. et Hohen. in Boiss. Diagn. Ser. 1, viii. p. 108. *Alcea sulphurea* Boiss. Fl. Or. i. 827.—Caulibus erectis tenuiter tomentosis, foliis pannosis flavidis ovatis vel suborbicularibus basi cordatis vel cuneatis lobatis subtus nervis prominentibus, bracteolis ovato lanceolatis calyce triplo brevioribus, sepalis ovatis acutis tomentosis, petalis flavidis, carpellis dorso transverse rugosis hirtis margine acutis.

Hab. Persia!

Stem 3 ft. high; leaves 2–3 in.; bracts $\frac{1}{3}$ in.; sepals $\frac{2}{3}$ in.; petals $1\frac{1}{4}$ in. long.

β. MICROCHITON Boiss. Fl. Or. i. 827. *A. rhyticarpa* Trautv. in Sched. Pl. Schrenk.—Bracteolis calyce dimidio brevioribus.

Hab. Persia. Afghanistan. Songoria!

A. rhyticarpa Trautv. may be a distinct species.

8. A. ACAULIS Cav.; DC. Prod. i. 437. *Alcea acaulis* Boiss. Fl. Or. i. 827. — Acaulis vel caule brevi a basi florifero, foliis subpannosis longe petiolatis reniformibus interdum lobatis basi subcordatis tomentosis crenatis, pedunculis brevibus, bracteolis acutis calyce triplo brevioribus, calycis lobis acutis, petalis roseis interdum albis, carpellis glabris transverse rugosis.

Hab. Syria! Palestine!

Stem $\frac{1}{2}$–1 ft. long; leaves $1\frac{1}{2}$ in.; petiole sometimes 6 in.; bracts $\frac{1}{5}$ in.; sepals $\frac{1}{2}$ in.; petals 1 in. long.

9. A. RUFESCENS Boiss. Diagn. Ser. ii. 1, p. 102. *Alcea rufescens* Boiss. Fl. Or. i. 828. — Caule tenuiter rufescenti-tomentoso humili inferne ramoso ramis virgatis, foliis ovatis trilobatis basi subcordatis, pedunculis brevibus, bracteolis triangularibus calyce triplo brevioribus, calycis lobis oblongis acutis, petalis flavidis, carpellis hirtis margine acutis.

Hab. Syria! Palestine.

Stem $1\frac{1}{2}$–2 ft.; leaves 5 in.; bracts $\frac{1}{3}$ in.; sepals 1 in.; petals, $1\frac{1}{2}$ in. long. This plant may be distinguished from the preceding by its lax raceme, in which the flowers are not subtended by leaves.

10. A. REMOTIFLORA Boiss. et Heldr. in Boiss. Diagn. Ser. 1, viii. p. 108. *Alcea remotiflora* Boiss. Fl. Or. i. 828.—Caule humili tomentoso griseo scabrido virgato, ramis tenuibus, foliis parvis ultra medium 5–7-palmatipartitis, floribus 1–2 axillaribus, pedunculis brevibus, bracteolis triangularibus, calyce dimidio brevioribus, sepalis lanceolatis acutis, petalis obcordatis pallide roseis, carpellis rugosis angustis facie glabris ad medium dorsi puberulis.

Hab. Pamphylia! Armenia.

Stem $1\frac{1}{2}$–2 ft.; leaves 1 in.; bracts $\frac{1}{4}$ in.; sepals nearly $\frac{1}{2}$ in.;

petals ⅔ in. long. In Herb. Kew there is a plant from Kedesh Naphthah (W. A. Hayne) near *remotiflora*, which has longer peduncles and petioles, and larger petals.

11. A. LAVATERÆFLORA DC. Prod. i. 437. *Althæa digitata* Boiss. Diagn. Ser. 1, viii. p. 106. *A. lavateræflora* Boiss. Fl. Or. i. 828.—Caule erecto piloso, foliis longe petiolatis magnis adpresse tomentellis infimis ultra medium palmatilobatis lobis oblongis obtusis irregulariter crenatis, floribus solitariis remotis, pedunculis brevibus, bracteolis calyce subæquantibus, sepalis hirsutis, petalis obcordatis violaceis, carpellis hirtis undique rugosulis.

Hab. Syria! Palestine! Afghanistan!

Stem 3–5 ft.; leaves 3–4 in.; bracts ⅔ in.; sepals 1 in.; petals 1½ in. long.

β. GLABRESCENS Boiss. Fl. Or. 820. = *A. ægyptiaca* Boiss. Diagn. Ser. 2, i. p. 103.—Caulibus glabris, foliis ad medium palmatilobatis.

Hab. Egypt!

? γ. KIRRINDENSIS Boiss. Fl. Or. i. 829 = *A. kirrindensis* Boiss. Diagn. Ser. 2, v. p. 67. — Caulibus præter setulas diffusas glabris, bracteolis calyce dimidio brevioribus.

Hab. Kirrind, Persia.

12. **A. dissecta**, n. sp.—Caule crasso erecto tereti glabro, foliis profunde palmatilobatis segmentis oblongo-linearibus membranaceis glabris serratis, petiolis folio brevioribus, floribus axillaribus solitariis foliis non subtendentibus, pedunculis bracteolis multo longioribus, bracteolis brevibus cuspidatis externe glabris non striatis calyce triplo brevioribus, sepalis oblongo-lanceolatis, petalis obcordatis, carpellis apterocarpis margine acutis transverse rugosis hirtis.

Hab. Galilee, *Lowne*! Duma, *Post*! Hb. Kew.

Stem 3–4 ft. high; segments of leaves 3–4 in. by ⅔ in.; petiole 2–3 in. long; bracts ¼ in.; sepals a little over ½ in.; petals 1½ in. long. This plant is related to *A. lavateræflora* DC., but it is easily distinguished from this species by its deeply-divided glabrous leaves and short bracts.

13. A. SETOSA Boiss. Diagn. Ser. 1, viii. p. 107. *Alcea setosa* Boiss. Flor. Or. i. 829. — Caule elato simplici petiolisque setis deflexis hispidis, foliis sparsim hirtis cordato-orbiculatis obtusissime 5–7 lobis, racemo longo basi excepta aphyllo, pedunculis bracteolis æquilongis, sepalis calyce subbrevioribus calycisque laciniis valde tomentoso-hirtis triangularibus, petalis obcordatis intense purpureis, carpellis (junioribus) dorso hirtis planiusculis.

Hab. Palestine.

Stem 4–6 ft. high.

14. A. STRIATA DC. Prod. i. p. 437. *Alcea striata* Boiss. Fl. Or. i. 829. — Caule erecto tenuiter tomentello, foliis longe petiolatis cordato-ovatis interdum lobatis crenatis, floribus 1–2 axillaribus remotis, pedunculis brevibus, bracteolis calyce triplo brevioribus, sepalis lineatis lanceolatis acutis, petalis obcordatis pallide roseis, carpellis glabris rugosis.

Hab. Sinai! Arabia Petræa!

Stem 2–6 ft. high; petioles 4–8 in. long; leaves 2–3 in.; bracts $\frac{1}{5}$ in.; sepals $\frac{1}{2}$ in.; petals 1–1$\frac{1}{2}$ in. long.

β. ASSYRIACA Boiss. Fl. Or. i. 829. — Caule subcrassiori, petalis intense violaceis. *A. leucantha* Ehrnb. Rchb.; Ic. Bot. Exot. t. 213, is probably this plant.

15. A. LASIOCALYCINA. *Alcea lasiocalycina* Boiss. Fl. Or. i. 830. —Caule erecto tenuiter tomentello, foliis membranaceis suborbicularibus vel palmatifidis lobatis serratis, floribus 1–2 axillaribus, racemo brevi subaphyllo, bracteolis calyce subæquantibus lanceolatis acutis, sepalis lanceolatis acutis tomentosis, petalis retusis sulphureis vel pallide roseis, carpellis hirtis rugosulis.

Hab. Tang, Armenia!

Stem 2–3 ft.; leaves 6 in. in diameter; bracts $\frac{1}{2}$ in.; sepals $\frac{2}{3}$ in.; petals 2 in. long.

16. A. HAUSSKNECHTII. *Alcea Hausskneehtii* Boiss. Fl. Or. i. 830.—Caule elongato breviter tomentoso scabro in racemum dense floriferum longum foliosum abeunti, foliis cordato-orbiculatis obtuse 5–7 lobis, pedunculis inferioribus calyci æquilongis superioribus brevissimis, bracteolis calyce triplo brevioribus, sepalis lanceolatis acutis, petalis bilobis longe unguiculatis intense violaceo nigricantibus.

Hab. Tcharmelik, Syria.

Raceme 2–3 ft. long; sepals $\frac{1}{2}$ in.; petals 2 in. long.

17. A. APTEROCARPA Fenzl Cat. Hort. Vindob. 1858. *Alcea apterocarpa* Boiss. Fl. Or. i. 830.—Caule erecto adpresse tomentoso, foliis suborbicularibus vel palmatilobatis serratis, pedunculis brevibus, bracteolis calyce subæquentibus triangularibus acutis, sepalis lanceolatis acutis tomentosis, petalis roseis vel purpureis, carpellis rugosissimis hirtis marginibus acutis.

Hab. Attica! Lycia! Cilicia!

Stem 3–4 ft. high; leaves 2 in.; bracts $\frac{1}{3}$ in.; sepals $\frac{1}{2}$ in.; petals 1$\frac{1}{2}$ in. long.

β. LILACINA = *A. lilacina* Boiss. et Ky. Fl. Or. i. 831. — Foliis ovatis lobatis, floribus lilacinis.

Hab. Gumgum, Armenia!

I doubt this plant being really distinct from *A. rosea* Cav.

18. A. PONTICA. *Alcea pontica* Janka, Brev. ii. No. 26. — Caule a basi ramos paucos et æquilongos edenti, foliis longe petiolatis amplis peltatis vel orbiculatis pentagonis crenatis supra parce subtus densius tomentoso pubescentibus ramealibus trilobatis, pedunculo bracteolis breviore, bracteolis calyce æquilongis, sepalis elevatim lineatis tomentosis ovato triangularibus, petalis retusis violaceis, carpellis hirsutis facie reticulatis dorso marginibus acutis.

Hab. Rumili Phanar, Bosphorus, *Janka.*

Stem 3 ft. high; petals 1$\frac{1}{2}$ in. long.

19. A. MICROCHITON. *Alcea microchiton* Alef. in Oest. Bot. Zeit. 1862, p. 254. — Caule erecto inferne glabro superne griseo, foliis ovatis adpresse tomentosis, floribus axillaribus solitariis in axilis foliorum, pedunculis inferioribus calyce æquilongis, bracteolis triangularibus dimidio calyce brevioribus, sepalis lanceolatis acutis,

petalis bilobis intense violaceis, carpellis tenuiter rugosis margine acutis.

Hab. Pamphylia, *Heldreich*!

Stem 2–3 ft. high; leaves 1–2 in. long; bracts $\frac{1}{4}$ in.; sepals $\frac{1}{2}$ in.; petals $1\frac{1}{2}$ in. long.

20. **A. Loftusii**, n. sp. — Caule erecto flexuoso inferne tereti glabro superne minute adprésse tomentoso, stipulis parvis lineari-lanceolatis, petiolis inferioribus laminis æquilongis, foliis ovatis vel oblongis basi cuneatis vel subcordatis margine integris subtus nervis prominentibus, pedunculis axillaribus longis 1–2 floribus, bracteolis triangularibus acutis dimidio calyce brevioribus, sepalis oblongis acutis tomentosis, petalis magnis obcordatis, carpellis canaliculatis ad medium dorso hirtis transverse rugosis marginibus acutis, seminibus reniformibus.

Hab. Mountains of Mungerrah, near Dizful, Persia, No. 43, *W. K. Loftus*! Herb. Mus. Brit.

Leaves 4–5 in. long, 2–3 in. broad; bracts $\frac{1}{3}$ in.; sepals $\frac{2}{3}$ in.; petals nearly 2 in. long.

(To be continued.)

A NEW *LASTREA* FROM ASSAM.

By C. W. Hope.

Nephrodium (*Lastrea*) **Mannii**, n. sp.—*Rhizome* suberect (?), clothed with nearly linear, pale-brown, hair-pointed scales; *stipes* tufted, very long, longer even than frond, stiff, wiry, and, together with the main rachis, channelled deeply on upper side and slightly on under side; *stipe* and *main rachis* densely clothed to within a few inches of apex of frond with hairy scales (or hairs), three-eighths of an inch and less in length, changing rapidly upwards from the colour of those on the rhizome to very dark brown; *frond* oblong-lanceolate, truncate at base, $18\frac{3}{4}$ in. long, $6\frac{1}{2}$ in. broad halfway up, increasing to $9\frac{3}{4}$ in. at base, upper half lanceolate, gradually acuminate; *pinnæ* narrow, oblong, slightly falcate, acuminate towards tip, about 12 pairs distinctly stalked, above which the lowest pinnule on lower side becoming decurrent on main rachis, upper 20 or more pairs sessile, distance between pinnæ gradually increasing downwards to $1\frac{1}{2}$ in.; lowest pair of pinnæ slightly the longest, nearly 5 in. long; pinnæ of lower half of frond bipinnate for part of the way up (*i. e.*, towards base cut down quite to the rachis and with intervals between the pinnules), as to the rest of the frond to within 4 in. of tip cut down to rachis but for a distinct *sinus* between each into oblong, falcate segments, unequally rounded at point, decurrent on rachises; pinnæ $\frac{3}{4}$ in. and rather more wide at base of frond, scarcely diminishing in width till near the apex; pinnules of segments $\frac{7}{16}$ths of an inch long by $\frac{3}{16}$ths broad, entire in the upper part of the frond and becoming gradually lobed (most so on lower side) towards the base, not anywhere toothed at apices;

lowest pair of pinnæ very unequal-sided, being eared (like *Pteris quadriaurita* Retz.) by prolongation of several pinnules on lower side to 2 in. in length, these pinnules being nearly ⅝ths of an inch wide and pinnatifid nearly to the rachis; lowest pair of pinnules of each pinna of lowest three-quarters of frond cordate and not decurrent at base, and those of lowest pinnæ almost stalked; in upper part of frond *costæ* of lowest pinnules on lower side of pinna springing from main and not from secondary rachis; *texture* herbaceous; secondary rachises and costæ of pinnules pubescent, especially above, and near main rachis clothed like it, but chiefly underneath, with black-brown hair-like scales, replaced upwards on pinnæ by adpressed dark-brown linear glands; costæ of pinnules and the veins above furnished also with small pale-coloured narrow scales or glands, and the whole upper surface of *lamina* closely covered with very minute short hair-like glands; *veins* in upper portion of frond all simple, 5–6 on either side of a pinnule, lower down (where pinnules are lobed), veins of lower lobes forked; *sori* medial on the veins, and sometimes also on the veinlets; *involucres* persistent, shrivelling up from point of attachment.

This description has been written from a single specimen, consisting of one frond, attached to a section of apex of rhizome, with another young curled-up frond attached, which is densely clothed with the characteristic black-brown hairs,—received from Mr. Gustav Mann, Conservator of Forests, Assam, and collected by him at Dighai (or Digbai), Makum Forest, Lakkimpur, Upper Assam, in March, 1889.

The noteworthy features of the fern are the great and almost disproportionate length of stipe, the dark-hairiness of stipe and rachises, and the unequalsideness and compound division of the lowest pair of pinnæ (if this be a constant feature), as contrasted with the narrow shape and simple cutting of the rest of the pinnæ.

The above description was sent to Mr. Mann for approval, and in returning it without alteration he said, in a letter dated from camp in the Garo Hills, that he was away from his collection and should probably not return to head-quarters for five months, and therefore could not refer to his other specimens of the fern; but he said that the description was near enough, and added:—"I have always considered it a distinct species. It is very constant, and I have collected it in three different localities very far apart, namely: Dighai, in Upper Assam; the southern base of the Khasi Hills, near the Sylhet district; and in Cachar. I have never distributed this fern, because I considered it new, and only sent it to you. One of the reasons why I considered it *not* a form of *Filix-mas*,* if these can be called so at all, is that it grows, speaking broadly, in the plains, generally at or near the foot of hills, at no elevation, or at any rate not more than about 500 ft. above the level of the sea, whilst all the so-called forms of *Filix-mas* are temperate ferns, growing at 5000 ft. altitude, and more in this part of India. I have now 16 specimens of it, but hope to get some more within the next five months. It is not a very rare fern, neither is it common, and it is so distinct that a man, even if he were blindfolded, could make it out by the touch."

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* A well-known authority, who had seen a specimen, had named it *N. Filix-mas* var.

MARINE ALGÆ OF DEVON.

By E. M. Holmes, F.L.S.

In a list of the Marine Algæ of Devonshire, by E. Parfitt, published in the 'Transactions of the Devonshire Association for the Advancement of Science, Literature, and Art,' the number of species recorded is given as 318. From an examination of the species enumerated, it seems doubtful whether Mr. Parfitt has seen the list by Mr. J. Boswarva, of Plymouth, from which some additional localities for Devon algæ might have been quoted; and it may therefore be useful to place these on record, and to add to them some other species which I myself have met with in Devonshire. The additions to Mr. Parfitt's list are marked with an asterisk.

Pycnophycus tuberculatus Huds. Mt. Batten, *Boswarva.* Abundant at Bovisand and Wembury, also near Plymouth, *E. M. H.*

**Fucus platycarpus* Born. Plymouth and Torquay, *E. M. H.*

Arthrocladia villosa Duby. Firestone Bay, Plymouth, *J. Gatcombe.*

**Laminaria flexicaulis* Le Jol. Common at Plymouth, Torquay, &c., *E. M. H.*

**Carpomitra Cabreræ* J. Ag. Plymouth Sound, *Boswarva.*

**Dictyota ligulata* J. Ag. (new to Britain, 1889). Torquay, *E. M. H.* (Also Charmouth and Lyme Regis, in Dorsetshire).

Leathesia Berkeleyi Harv. Sidmouth, *E. M. H.*

Ralfsia verrucosa J. Ag. It is this species, and not *R. deusta*, which occurs on the Devon coast. I have seen no British specimen of *R. deusta*, which appears to be quite a northern species. — **R. clavata* Farl. Torquay, *E. M. H.*

Sphacelaria fusca Agardh. This plant is not so rare as Mr. Parfitt supposes. I have found it abundantly at Ilfracombe, Torquay, &c., but it always grows in very shaded pools. — *S. olivacea* J. Ag. Ladram Bay, Sidmouth, *E. M. H.*

Ectocarpus simplex* Cr. On *Codium tomentosum*, Mudstone Bay, Brixham, *E. M. H.* — **E. virescens* Born. Torquay, *E. M. H.*— **E. reptans* Kjell. Exmouth, *E. M. H.*—E. Crouani* Thur. MSS. Near Brixham, *E. M. H.*

**Polysiphonia rhunensis* Born. Ilfracombe, *E. M. H.*— *P. pulvinata* Harv. The species so named by Mr. Parfitt is in all probability *P. sertularioides* J. Ag., which is not uncommon on the Devon coast, at Torquay, Plymouth, &c., *E. M. H.*

Lomentaria reflexa J. Ag. This plant is abundant at Hele, near Ilfracombe, and occurs also at Sidmouth and Torquay, *E. M. H.*

Melobesia Thureti* Born. Sidmouth, *E. M. H.*—M. Lenormandi* Aresch. Torquay, Plymouth, Sidmouth, Lynmouth, &c., *E. M. H.* —*M. Laminariæ* Crn. Sidmouth, &c., *E. M. H.* — **M. Corallinæ* Crn. Sidmouth, &c., *E. M. H.*

Delesseria angustissima J. Ag. It is extremely doubtful if this northern plant was found at Ilfracombe by Mr. Griffiths, as Mr. Parfitt states.

**Nitophyllum uncinatum* J. Ag. Ladram Bay, Sidmouth, *E. M. H.*

Rhodymenia nicæensis Holmes. Torquay, *E. M. H.*

**Grateloupia dichotoma* J. Ag. Rennie Rocks, Plymouth, *E. M. H.* —*G. filicina*. Lynmouth, *E. M. H.*

Microcladia glandulosa Grev. This plant was found parasitical on stems of *Laminaria* near Brixham: but at Falmouth I have seen it growing on rocks at low water, *E. M. H.*

**Callithamnion plumula* J. Ag., var. Abundant at Mount Edgcumbe, Plymouth, *E. M. H.*

**Monospora clavata* Solier. Sidmouth, *E. M. H.*

Codiolum gregarium A. Br. Lynmouth, *E. M. H.*

**Monostroma latissimum* Wittr. Budleigh Salterton, *Rev. R. Cresswell.* — **M. Grevillei* J. Ag. Torquay, *E. M. H.* — **M. Wittrockii* Born. Plymouth, *R. V. Tellam.*

**Prasiola marina* Cr. Pier, Torquay, *E. M. H.*

Derbesia marina Solier. (*Vaucheria marina* Harv.). Ladram Bay, Sidmouth, *E. M, H.* There appears to be some mistake about the *Vaucheria marina* mentioned by Mr. E. Parfitt, since *D. marina* usually grows parasitically on other algæ, and not on mud; whilst *V. dichotoma* var. *submarina* grows freely on mud.

Calothrix pannosa Ag. This plant is *C. pulvinata* of Agardh. — *C. semiplena* Harv. This is *Symploca Harveyi* Le Jol.—*C. hydnoides* Harv. This is *Calothrix pulvinata* Ag.

**Symploca fasciculata* Kg. On corallines, Ladram Bay, *E. M. H.*

**Dermocarpa prasina* Reinsch. On *Catenella*, Sidmouth, *E. M. H.*

Lyngbya Carmichaeli Harv., *L. speciosa*. and *L. Cutleriæ* are now usually referred to the genus *Ulothrix* as *U. flacca* Thur., *U. speciosa* Ktz., and *U. isogona* Thur. respectively, although by a few algologists they are included under a single species, *Urospora penicilliferum* Aresch.* It is, however, to say the least, convenient to keep the plants distinct, since they differ in habit as well as in measurements and consistence.

I may add, in conclusion, that Mr. H. Johnston dredged *Carpomitra Cabreræ*, *Stenogramme interrupta*, *Gigartina pistillata*, and *Granularia multipartita* in Plymouth Sound last year, so that these very rare British species are evidently natives of Devon. I also found the still rarer *Gigartina Teedii* in its sole British locality near Torquay, two years ago.

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* De Toni, 'Sylloge Algarum,' p. 232.

THE GENERA OF *STAPELIEÆ*.

The most recent number (March, 1890) of the 'Icones Plantarum' is devoted entirely to illustrations and descriptions of the *Stapelieæ* collected by Sir Henry Barkly in South Africa, from the pen (and in some instances from the pencil) of Mr. N. E. Brown. Mr. Brown has for twenty years worked assiduously at this interesting and difficult group of plants, and the present may be regarded as a contribution to the monograph which we hope for from his pen. Besides the descriptions and figures, Mr. Brown gives us a key to the genera, prefaced by an interesting sketch of the growth of our knowledge of the group, and valuable remarks based upon his studies of the plants in cultivation as well as in a dried state. These tend to show that the reduction of genera here made by Mr. Brown will be carried further as our knowledge of the group increases. "In spite of having thus limited the genera to few, rather than increased their numbers," he says, "I am of opinion that some of the genera still retained are more artificial than natural; for instance, *Frerea* and *Trichocaulon* only differ from *Caralluma* in habit, and *Trichocaulon* only differs from *Hoodia* in its corolla, for although some of the species have a different corona, one has a corona undistinguishable from that of *Hoodia;* possibly it would be more logical and convenient, after all, to do as our predecessors did, and place them all in the genus *Stapelia*, with the exception of *Decabelone*, *Diplocyatha*, *Duvalia*, *Huernia*, and *Huerniopsis*." Thirteen genera, however, are still retained, and are arranged by Mr. Brown as follows:—

I. Corona simple, outer corona wanting (very rudimentary in *Echidnopsis*. See also *Caralluma hottentotorum*).

1. Stems usually 4-angled, occasionally 5- to 6-angled, short.
    Corolla distinctly campanulate; coronal segments stout, with the apex produced, erect. 8. Huerniopsis N. E. Br.
    Corolla rotate, or rarely with a very short tube, not campanulate; coronal segments crested on the back. 12. Piaranthus R. Br.
2. Stems teretely many-angled, tessellate-tuberculate, elongating. Corolla small, saucer-shaped; coronal segments not crested. 3. Echidnopsis Hook. f.

II. Corona double, outer corona present, arising from the staminal tube.

1. Lobes of the corolla cohering at their apex. 4. Pectinaria Haw.
2. Lobes of the corolla not cohering at their apex.
    A. Limb of the corolla nearly entire, 5-cuspidate, the lobes almost obsolete, outer corona cup-shaped, 5-lobed; stems with numerous tuberculate angles, the tubercles bristle-tipped. 6. Hoodia Sweet.

B. Limb of the corolla distinctly and usually deeply 5-lobed:

a. Stems terete, bearing distinct leaves an inch long; corolla small, rotate; outer corona cup-shaped, the inner coronal segments not produced at the apex. 1. FREREA Dalz.

b. Stems thick, covered with confluent tubercles more or less arranged in numerous rows or spirals, sometimes irregular, leafless, the tubercles with or without bristle-tips; corolla small, cup-shaped, or subcampanulate; outer corona of five deeply bifid or emarginate lobes, connate at the base, and adnate to the back of the simple inner coronal segments. 5. TRICHOCAULON N. E. Br.

c. Stems 6–12 angled, leafless, the angles tuberculate, tubercles tipped with three bristles, the two side ones deflexed; corolla large, tubular-funnel-shaped; outer corona cup-shaped at the base, produced into ten filiform processes ending in knobs; inner coronal segments simple, ovate, adnate behind to the outer corona. 7. DECABELONE Dcne.

d. Stems usually 4-angled, rarely 5–6-angled, leafless, or with rudimentary leaves, angles acute or obtuse, toothed or tubercled, the tubercles often spine-tipped, sometimes irregularly placed, rarely obsolete.

† Corolla with a distinct campanulate tube, longer or shorter than the lobes.

x. Outer corona cup-shaped, at least at the base, the segments being adnate to the sides of the inner coronal segments at their base, or connate and adnate to their back, the margin denticulate or produced into five short or long bifid or 2-forked lobes; inner coronal segments simple or 2-horned, not longer than the anthers, or produced beyond them into erect points. 2. CARALLUMA R. Br.

xx. Outer corona of five emarginate or bifid segments, more or less connate at the base, but not adnate to the sides or back of the inner coronal segments.

* Corolla-tube double, an inner tube with a thickened rim arising from near the base of the outer tube. 10. DIPLOCYATHA N. E. Br.

** Corolla-tube simple, the base of the sinuses between the lobes produced into small triangular teeth; outer corona sessile on, and partly adnate to, the base of the corolla. 9. HUERNIA R. Br.

xxx. Outer corona of five segments free to the base. (See also HUERNIA.)

Corolla-lobes 2–4 times longer than broad. 2. CARALLUMA R. Br.

Corolla-lobes not much longer than broad. 11. STAPELIA Linn.

†† Corolla rotate and star-like, or broadly cup-shaped, with or without a raised rim (annulus) on the disc or base of the cup, sometimes forming a short tube for the corona, but with no distinct campanulate tube.

0 The base of the sinuses between the corolla-lobes produced into triangular teeth; outer corona sessile on, and adnate to, the base of the corolla. 9. HUERNIA R. Br.

00 The base of the sinuses between the corolla-lobes not produced into teeth; outer corona not adnate to the base of the corolla.

8 Outer corona of five segments free to their base, entire, emarginate, bifid or trifid. (See also next paragraph, CARALLUMA.) 11. STAPELIA Linn.

88 Outer corona cup-shaped, or the segments very deeply divided into two subulate lobes, and more or less adnate at the base to the staminal tube or base of the inner coronal segments so as to form a small pouch at the base, rarely quite free to the base. 2. CARALLUMA R. Br. (See also *Stapelia intermedia*.)

888 Outer corona in one piece, disc-like, pentagonal, resting on the rim of the annulus, and closing the spurious tube formed by it; corolla-lobes more or less folded lengthwise, and often into narrow vertical plates. 13. DUVALIA Haw.

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.

By JAMES BRITTEN, F.L.S., AND G. S. BOULGER, F.L.S.

(Continued from p. 119.)

[Now that the serial issue of this Index is approaching completion, we take the opportunity of announcing that we propose to issue it in a separate form. Our plan has somewhat extended itself as the work has proceeded, and no one can be more fully aware than we are ourselves of the numerous imperfections in our records, especially in the early part of the alphabet. We hope, therefore, that everyone who can will kindly send us any corrections or additions they may have noted as to what has already appeared, as well as any information as to names not as yet reached. We propose bringing the work as completely as we can down to date at the end of the present year, and issuing it early in 1891, bound in cloth, at 3*s.* 6*d.* per copy, to subscribers whose names are received before publication, the published price being 6*s.* Intending subscribers should send their names, but not the amount of subscription, to the Editor of this Journal, care of the Publishers, 54, Hatton Garden, E.C. Due notice will be given when the volume is ready for distribution.]

Pereira, Jonathan (1804–1853): b. Shoreditch, 22nd May, 1804; d. London, 20th Jan. 1853; bur. Kensal Green. M.D., Erlangen, 1840. F.R.S., 1838. F.R.C.P., 1845. F.L.S., 1828. Prof. Mat. Med. Pharm. Soc. 1843. Translation of 'Pharmacopœia,' 1824. 'Elements of Materia Medica,' 1839–40. Pritz. 243; Proc. Linn. Soc. ii. 237; R. S. C. iv. 825; Pharmaceut. Journ. 1852–53, 409, with portr. engr. by D. Pound from daguerrotype by Mayall. Bust by McDowall at London Hosp. Medal by Wyon at Pharm. Soc.

Perkins, E. E. (Mrs.) (fl. 1837). "Professor of Botanical Flower Painting." Of Chelsea. 'Elements of Botany,' 1837. Lectured on Botany. Jacks. 39.

Perry, William Groves (1796–1863): b. 1796; d. Warwick, 25th March, 1863. Curator, Warwicksh. Mus. 1840. F.B.S.Ed., 1840. 'Plantæ Varvicenses Selectæ,' 1820. Pritz. 244; Jacks. 261; Phyt. i. 700; Trans. Bot. Soc. Ed. viii. 14.

Petiver, James (c. 1658–1718): b. Hillmorton, Warwickshire, circ. 1658; d. London, 20th April, 1718. Apothecary to the Charterhouse. F.R.S., 1695. Contributed list of Middlesex pl. to Gibson's 'Camden,' and to Ray's 'Historia,' vols. ii. and iii., and 'Synopsis,' ed. 2, and to Phil. Trans. 1697–1717. 'Opera,' 1764. Plants in Hb. Sloane. Sloane MSS. 3330–3338. Pult. ii. 31; Pritz. 245; Jacks. 591; Fl. Midd. 379. *Petiveria* Plumier.

Petre, Robert James, 8th Baron (1713–1743): b. 3rd June, 1713; d. 2nd July, 1743. F.R.S., 1731. "The Phœnix of this age," Collinson. Had garden with large stoves, under Philip Miller's supervision, at Thorndon, Essex. Introduced *Camellia japonica*. Rich. Corr. 316, 340, 392; Linn. Letters, i. 9; MS. on fly-leaf of B.M. copy of Pult. ii. *Petrea* L.

Phelps, Rev. William (c. 1776–1856): b. Flax Bourton, Somerset, circ. 1776; d. Oxcombe, Lincoln?, 17th Aug. 1856. B.A., Oxf., 1797. Vicar of Meare and Bicknoller, Somerset, 1824. Rector of Oxcombe, Lincoln. 'Calendarium Botanicum,' 1810. Pritz. 246; Jacks. 233.

Phillips, Henry (fl. 1798–1829). F.L.S. Writer on cultivated plants. Schoolmaster at Bayswater; then of Brighton. 'Flora Historica,' 1824, ed. 2, 1829. 'History of Vegetables,' 1822. 'Pomarium Brit.' 1820. Pritz. 246; Jacks. 592; Johnson, 304.

Phillips, John (1800–1874): b. Marden, Wilts, 25th Dec. 1800; d. Oxford, 24th April, 1874; bur. York. Geologist. M.A., Oxon, 1853. D.C.L., 1866. LL.D., Camb., 1866; Dublin, 1845. F.R.S., 1834. Curator, York Museum, 1824. Prof. Geol., King's College, 1834; Dublin, 1844; Oxford, 1853. 'Geology of Yorkshire,' 1829–36. Jacks. 182; 'Nature,' ix. (1874), 510.

Phipps, Constantine John, 2nd Baron Mulgrave (1744–1792): b. 30th May, 1744; d. 10th Oct. 1792. Captain, R.N. M.P., Newark. Arctic navigator, 1773, in 'Racecourse' and 'Carcass,' with Israel Lyons. 'Voyage towards North Pole,' 1774. Plants pp. 200–204, described by Solander. Succeeded to title, 1775. Lasègue, 395. *Phipsia* Trin.

Piddington, Henry (d. before 1873). Coroner in Calcutta. 'English Index of Plants of India,' 1832. 'Tabular View of Genera in Roxburgh's Fl. Indica,' 1834. Cyclop. India (ed. 2), iv. 567; Pritz. 247; Jacks. 383; R. S. C. iv. 904. *Piddingtonia* DC.

Piesse, George W. Septimus (1820–1882): b. 30th May, 1820; d. Chiswick, 23rd Oct. 1882. 'Art of Perfumery,' 1856. Pritz. 247; Jacks. 210.

Pigott, —. (fl. 1798–1808). Algologist. Friend of Stackhouse, and correspondent of D. Turner. Imprisoned in France. Stackhouse, Nereis, xxvi.; Turner, Fuci, i. 130 (1808).

Pike, —. (fl. 1805). Of Bideford. Published Catalogue of Bideford Plants. Bot. Guide, 195.

Pilkington, William (1758–1848): b. Hatfield, Yorks., 7th Sept. 1758: d. same place, 13th Aug. 1848. F.L.S., 1795. Architect. Had a herbarium. Contrib. to Eng. Bot. (1276, 2029). R. S. C. iv. 912; Proc. Linn. Soc. ii. 47. Engr. portr. at Linn. Soc.

Pitcairn, William (1711–1791): b. Dysart, Fife, 1711; d. Islington, 25th Nov. 1791; bur. St. Bartholomew-the-Less. M.D., Rheims. M.D., Oxon, 1749. F.R.C.P., 1750. F.R.S. P.R.C.P., 1775. Had a bot. garden in Upper Street, Islington. Munk, ii. 172. Portr. by Reynolds. Mezzotint by J. Jones, 1777. *Pitcairnia* L'Hérit.

Pitchford, John (1737?–1803): d. Norwich, Dec. 22nd, 1803. Surgeon and apothecary of that town from 1769. A.L.S., 1788. F.L.S., 1797. Friend of Sir J. E. Smith. Smith Letters, i. 41, 107, 128; Linn. Trans. vii. 295; Hinds, Fl. Suff. 477. Contributed to Eng. Bot. (27, 229, &c.). Discovered *Holosteum umbellatum* and *Peucedanum palustre*.

Pitts, Edmund (fl. 1678). Alderman, of Worcester. "A very knowing botanist." Discovered *Pyrus domestica* in Wyre Forest. Phil. Trans. xiii. 1678, 978; Lees' Bot. Worcestersh. lxxxviii.

Planchon, Jules Emile (1823–1888): b. Ganges, France, 21st March, 1823; d. Montpellier, 1st April, 1888. F.L.S., 1855. Assistant in Sir W. Hooker's Herb., 1844–48. Prof. Bot., Ghent, 1849; Montpellier, 1881–88. Co-ed. 'Flore des Serres,' 1849–81. Pritz. 248; Jacks. 592; R. S. C. iv. 932; viii. 631. Ann. Bot. ii. 423 (1888), with bibliography. *Planchonia* Dun.

Planer, Richard (fl. 1699–1703). Surgeon. Sent plants to Petiver from Guinea coast. Mus. Pet. 46, 95.

Plant, R. W. (fl. 1844–1852). Of Cheadle. 'New Gardener's Dictionary' (n. d.), 1849? "Experimental cultivator and nurseryman," Bot. Reg. 1844, p. 89. Collected in S. Africa, 1850–52. 'Excursion in Zulu Country,' Journ. Bot. 1852, 222, 257. R. S. C. iv. 933. Plants at Kew. *Plantia* Herb.

Platt, Sir Hugh (fl. 1571–1606): bur. Hornsey? B.A., Camb., 1571–2. Of Copt-hall, Essex, and Kirby Castle and Bishop's Hall, Middlesex. Knighted, 1605. Had a garden in St. Martin's Lane, 1606. 'Garden of Eden' (posth.), 1653–60. 'Floraes Paradise,' 1608. Johnson, 69; Pritz. 248; Wood, Athen. Oxon., ed. Bliss, 622: Cooper, Athen. Cantab. ii. 436, with bibliog.

Plomley, Francis (1805?–1860): d. Maidstone, 9th Jan. 1860. F.L.S., 1845. Lectured on Botany to Weald of Kent Farmers' Club, 1849–51. Proc. Linn. Soc. 1860–61, xlii.

Plot, Robert (1640–1696): b. Sutton Baron, Borden, Kent, 1640; d. same place, 30th April, 1696; bur. Borden. B.A., Oxon, 1661. M.A., 1664. D.C.L., 1671. F.R.S., 1677; Sec., 1682. First Keeper of Ashmolean Museum, 1683. Mowbray Herald, 1695. 'Nat. Hist. of Oxfordshire,' 1677. 'Nat. Hist. of Staffordshire,' 1679. Plants in Hb. Sloane, cxiii. Pult. i. 350; Jacks. 592; Nich. Anec. ix. 547; Gent. Mag. lxv., 1089; Lhwyd's 'Nat. Hist.' ed. 2; Hasted, 'History of Kent'; Allibone; Chalmers; Hoefer; Rose; Michaud. Oil portr. in Bodleian Gallery. Engr. in Hope Collection. Portr. in 'Oxford Almanac,' 1749. *Plotia* Adans. = *Myrsina*.

Plukenet, Leonard (1642–1706): b. Jan. 1642; d. Westminster, 6th July, 1706; bur. Chancel of St. Margaret's, Westminster. M.D. Had a bot. garden at Old Palace Yard, Westminster. Queen's botanist to Mary II. Supervisor, Hampton Court Garden. 'Phytographia,' 1691. 'Almagestum,' 1696. 'Mantissa,' 1700. 'Amaltheum,' 1705. MS. in Bibl. Linn. Soc. (?). Herbarium of 8000 plants in Herb. Sloane. Had a farm at Horn Hill, Herts. Trans. Watford Soc. i. (1875), 23; Pult. ii. 18; Rees; Pritz. 249; Jacks. 593; Journ. Bot. 1882, 338; Fl. Midd. 374; Hoefer; Michaud. Portr. engr. Collins, 1690, in 'Phytographia.' *Plukenetia* Plumier.

Pocock, Robert (1760–1830): b. Gravesend, Kent, 21st Feb. 1760; d. Dartford, 26th Oct. 1830. Printer. Founded Nat. Hist. Society of Kent, 1812. Plants in Herb. Mus. Brit. 'Robert Pocock,' by G. M. Arnold, 1883, with portr.; Journ. Bot. 1884, 53 (portr.).

Pococke, Rev. Richard (1704–1765): b. Southampton, 1704; d. Meath, 15th Sept. 1765. B.A., Oxon, 1725. D.C.L., 1733. F.R.S. Travelled in East, 1737–42. 'Description of the East,' 1743. Bishop of Ossory, 1756; of Meath, 1765. MSS. in Mus. Brit. Rees; Nich. Anec. ii. 157; Lasègue, 409; Rose; Chalmers. *Pocockia* Ser.

Pollexfen, Rev. John Hutton (fl. 1836–1883): b. Orkney. M.D. F.B.S.Ed., 1836. Algologist. Helped Edmonston in 'Fl. Shetland' (1845). Journ. Bot. 1844, 431. *Pollexfenia* Harv.

Polwhele, Rev. Richard (1759–1838); b. Truro, 1759; d. March, 1838. Of Polwhele, Cornwall. Vicar of Manaccan, 1794–1816. List of plants with Cornish names in 'Hist. Cornwall,' i. 164, and iv. 125; 'Bot. Guide,' 194; Gent. Mag. 1838, i. 545.

Pool, Thomas (fl. 1695). Of Nottingham. "A diligent enquirer into Natural History," Mus. Pet. no. 89.

Poole, Rev. John (c. 1771–1857): b. Over Stowey, Somerset, c. 1771; d. 16th May, 1857. B.A., Oxon, 1792. Rector of Enmore, Somerset, 1796; of Swainswick, 1811. New Bot. Guide, 553.

Portland, Margaret, Duchess of [*See* HARLEY].

Porter, Sir Robert Ker (1780–1842): b. Durham, 1780; d. St.

Petersburg, 4th May, 1842. Historical painter. H.M. Consul at Caraccas, 1826–1841. Zoologist. Knighted, 1813. Caraccas plants in Fielding's Herb. at Oxford. Journ. Bot. 1854, 283; Ic. Pl. 864; Gent. Mag. 1842, ii. 99; 1850, ii. 364; 'Athenæum, 1842, 479; Allibone; Bryant; Hoefer; Michaud. *Porteria* Hook. = *Phyllactis.*

Potts, John (d. 1822): d. London?, Oct. 1822. Collector for Hort. Soc. in China (1821) and Bengal. Trans. Hort. Soc. v. iii. 427; vii. 25. *Pottsia* Br.

Potts, John (fl. 1842–1852). Manager of Mint at Chihuahua, Mexico. Sent plants to F. Scheer at Kew. 'Bot. Herald,' 285.

Power, Rev. John (d. 1864?): d. Cambridge, 1864? Of Atherstone, Leicester. Librarian, Univ. Cambridge, 1845–1864. 'Calendar of Flora at Market Bosworth,' 1807. Jacks. 256.

Power, Thomas (fl. 1845). M.D. Lecturer on Bot., Cork School of Medicine. 'Botanist's Guide for County of Cork,' 1845. Pritz. 252; Jacks. 250.

Poynter, Richard [*See* CORBET].

Prescott, John D. (d. 1837): d. St. Petersburg, 1837. Of St. Petersburg. Correspondent of Hooker and Lindley. "A learned and indefatigable botanist," Lindley, Bot. Reg. 1916. Collected in Russia. Herbarium of 25,000 species in Fielding's at Oxford. Lasègue, 279; Comp. Bot. Mag. ii. 342; Hook. Exot. Flora, t. 115; Wallich, List, p. 114. *Prescotia* Lindl.

Preston, Charles (fl. 1696–1701). M.D. Of Edinburgh. Correspondent of Ray, who styles him "eruditissimus vir, et curiosissimus stirpium observator." Sent plants from Scotland and France to Plukenet. Mus. Pet. no. 266; Pluk. Mant. 12; Herb. Sloan. xvi. lxi.; Ray Lett. (Derham) 308–16; Phil. Trans. 1696. *Prestonia* Br.

Preston, George (fl. 1710–1716). Superintendent, Edinburgh Garden, until 1716. 'Catalogus omnium Plantarum, &c.,' 1710. "An indefatigable botanist," Blair, Bot. Essays, pref. Misc. Essays, 101; Pult. ii. 9; Jacks. 411.

Price, John (1803?–1887): d. Chester, 1887. Of Chester. M.A. 'Old Price's Remains.' Papers on proliferous leaves in Liverpool Nat. Scrap-book and Proc. Chester Soc. Nat. Science (1878). R. S. C. viii. 662; Journ. Bot. 1888, 32.

Pritchard, Stephen F. (fl. 1836). List of plants of St. Helena, 1836. Pritz. 253; Jacks. 353.

Pryor, Alfred Reginald (1839–1881): b. Hatfield, Herts., 24th April, 1839; d. Baldock, Herts., 18th Feb. 1881; bur. Baldock. B.A., Oxon, 1862. F.L.S., 1874. 'Notes on Fl. of Hertfordshire,' Trans. Watford Nat. Hist. Soc. 1875–6. 'Flora of Hertfordshire,' ed. B. D. Jackson, 1887. Library and herbarium bequeathed to Herts. Nat. Hist. Soc. Journ. Bot. 1881, 276; Fl. Hertfordsh. xliv.; Jacks. 594; Proc. Linn. Soc. 1880–82, 19.

Priestley, Joseph (1733–1804): b. Fieldhead, Leeds, 18th March, 1733; d. Northumberland, Pennsylvania, 6th Feb. 1804. F.R.S., 1766. LL.D., Edinb., 1767. Went to America, 1794. 'Experiments relating to Nat. Philosophy,' 1781. R. S. C. v.

19; Memoirs, partly autob., 1806–7; Life by Corry, 1805; Misc. Works, 1817–1834, with bibliog.; Chalmers; Hoefer; Michaud (by Cuvier); Allibone; Gent. Mag. 1804, i. 375. Portr. in 'Profiles of Warrington Worthies.' *Priestleya* DC.

Pulteney, Richard (1730–1801): b. Loughborough, Leicester, 17th Feb. 1730; d. Blandford, Dorset, 13th Oct. 1801; bur. Langton, near Blandford. M.D., Edinb., 1764. L.R.C.P. 1765. F.L.S., 1790. F.R.S., 1762. F.R.S.E., 1793. Practised as surgeon and apothecary at Leicester, and from 1765 at Blandford. Contributed list of plants to Nichols' 'Hist. Leicestershire'; and to Hutchins' 'Hist. Dorset.' 'View of Writings of Linnæus,' 1781. 'Biographical Sketches,' 1790. Collections bequeathed to Linn. Soc. MS. 'Flora Anglica' in Bot. Dept., Mus. Brit. Rees; Pritz. 254; Jacks. 594; Memoir by Maton in 'Writings of Linnæus,' ed. 2, with portr.; Memoir by John Aikin in 'Phil. Mag.; Gent. Mag. lxxi. (1801), 1058, 1207; Munk, ii. 264; Cott. Gard. viii. 315; Gorham, 102; Nich. Anec. viii. 196, and Hist. Leicester, iii. 848, both with portr. engr. Basire, after oil by T. Beach (1788) at Linn. Soc. Also engr. by T. Roberts. Portr. Kew. *Pultenæa* Sm.

Purdie, William (d. 1857): d. Trinidad, 10th Oct. 1857. Kew Collector in Trop. America and W. Indies. Journal in Journ. Bot. 1844–5. Curator, Bot. Gard. Trinidad, 1846. Journ. Bot. 1847, 40; Gard. Chron. 1857, 792; R. S. C v. 43. Plants at Kew. *Purdiæa* Planch.

Purton, Thomas (1768–1833): b. Endon Burnell, Chetton, Salop, 10th May, 1768; d. Alcester, Warwick, 1833. Surgeon. Practised in London, 1791–1795, and then at Alcester. Fungologist. Friend of Smith, W. J. Hooker, Greville, and Sowerby. 'Midland Flora,' 1817–1821. Pritz. 255; Jacks. 246; R. S. C. v. 46; Mag. Nat. Hist. ix. (1836), 606; Lees' 'Botany of Worcester,' lxxxix.

Quekett, Edwin John (1808–1847): b. Langport, Somerset, Sept. 1808; d. 28th June, 1847. Microscopist and Surgeon. F.L.S., 1836. Lect. Bot. London Hosp., 1835. Orig. Memb. R. Microscopic Soc. R. S. C. v. 53; Proc. Linn. Soc. i. 378; Phyt. iii. 110. *Quekettia* Lindl.

Quekett, John Thomas (1815–1861); b. Langport, Somerset, 1815; d. Pangbourne, Berks, 20th Aug. 1861. Brother of preceding. Microscopist. Professor of Histology, R. Coll. Surg., 1856. F.R.S., 1860. F.L.S., 1857. 'Lectures on Histology,' 1852–4. 'Cat. Fossil Pl. in Mus. Roy. Coll. Surgeons,' 1855. Proc. Linn. Soc. 1861–2, xciii. Pritz. 255; Jacks. 594; R, S. C. v. 553; Gent. Mag. 1861, ii. 338, 454; 'Athenæum,' 1861, ii. 254.

Quicke, William (fl. 1600). Apothecary. Found *Smyrnium*. Parkinson, 'Theatrum,' 930.

(To be continued.)

SHORT NOTES.

Lejeunea Rossettiana Massal.—Owing to the excellent paper on this species by Mr. Pearson in this Journal for December last, I have been led to examine some old gatherings of *L. calcarea* Lib., more especially as I had gathered what I took to be that species at Gordale, one of the localities mentioned for *L. Rossettiana* Massal. However, I found that what I had gathered in Gordale has been all distributed. I examined several other gatherings made at different times from Dent, Heseltine Ghyll (Penyghent), and Ingleton; all these proved to be *L. calcarea* Lib., but one; this was one of the various gatherings from Ingleton, and one of the latest, made in September, 1884. This was a gemmiferous form of *L. Rossettiana* Massal., giving another locality, and I have no doubt but that some of the specimens lying in herbaria as *L. calcarea* Lib. will prove to be *L. Rossettiana* Massal., although the former is most frequent on the mountain limestone of Yorkshire, for several collections I have made this spring proved to be *L. calcarea* Lib. These species of *Lejeunea* usually occur on moist shady vertical limestone rocks near streams, associated with *Seligeria pusilla* Ehrh., *Lecidea cupularis* Ehrh., *Amphiloma lanuginosum* Ach., *Nostoc macrosporum* Meneg., *N. muscorum* Ag., and *Orthothecium rufescens* Dicks., often occurring nearer the base of the same rocks, while masses of *Bartramia Œderi* Swartz. hang from above.—Wm. West.

Glamorgan Plants. — The following were noticed by me in the neighbourhood of Swansea during a short visit in October last. All are additions to the second edition of 'Topographical Botany,' and with the exception of *Epilobium palustre* L., which is noticed on p. 5 of this volume, in a paper by the Rev. E. S. Marshall, on my authority, I believe that none of them have yet been published. The list, short as it is, contains some very common species and varieties, and is an evidence of the backward state of botanical study in this interesting county:—*Fumaria muralis* Sonder, *Rubus Lindleianus* Lees, *R. rusticanus* Merc., *R. leucostachys* Sm., *R. macrophyllus* W. & N., *R. echinatus* Lindl., *R. corylifolius* Sm., *Rosa canina* L., var. *lutetiana* Leman., var. *dumalis* Bechst., var *urbica* Leman., var. *dumetorum* Thuill., *Epilobium obscurum* Schreb., *E. palustre* L., *Fœniculum officinale* All. (casual), *Lonicera Periclymenum* L., *Taraxacum officinale* Web., *Primula vulgaris* Huds., *Borago officinalis* L. (casual), †*Betula pubescens* Wallr., *Salix Caprea* L., *Lemna trisulca* L., *Potamogeton natans* L., *Agropyron junceum* Beauv. —Edward F. Linton.

Buda *v.* Tissa.—I have abstained from comment on certain eccentricities of the neo-American school of nomenclature, because I was not willing to occupy the limited space of the Journal by again calling attention to the mischievous tendency of innovations which have been already sufficiently exposed.* But, as the question of priority connected with the above synonyms of *Spergularia* affects the naming of British plants, it may be well to call attention to the grounds on which *Buda* (revived by Dumortier in 1827) is superseded by *Tissa* (revived by Prof. E. L. Greene in 1888). In a review of Dr. Sereno Watson's edition of Gray's 'Manual of the Botany of the Northern United States,' published in the 'Botanical Gazette' for March last, Prof. Trelease writes as follows:—"It is to be regretted that *Spergularia* of the old edition appears in this edition as *Buda* and not *Tissa*. The priority of the latter, to be sure, is only that of a few pages of a book, both being used in the same work by one author; but the birthright of *Tissa* is not invalidated by this fact, and its use in a recent monograph by Dr. Britton, prior to the appearance of the Manual, is an additional reason for its use there as a means of avoiding an increase in the number of synonyms." As I have already pointed out in this Journal,[*] the two names occur *on the same page* of Adanson's 'Famille des Plantes,' so that the "birthright" of the two is equal, and neither can claim priority; while the objectionable "increase in the number of synonyms" is due, not to Dr. Watson but to Dr. Britton, who deliberately ignored Dumortier's restoration, sixty years before, of a name having equal claims with that preferred by himself.—James Britten.

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* Journ. Bot. 1888, 257, 296.

NOTICES OF BOOKS.

Articles in Journals.

Bot. Centralblatt (No. 14). — R. Herse, 'Zur Entwickelungsgeschichte der Hypogaeen.'—(Nos. 14–16). M. Willkomm, 'Vegetationsverhältnisse von Traz os Montes.'—(Nos. 15–17). R. Keller, 'Beiträge zur schweizerischen Phanerogamenflora.'—A. Allescher, 'Ueber einige aus dem südlichen Deutschland weniger bekannte Sphæropsideen und Melanconieen.' — C. Warnstorf, '*Sphagnum degenerans* var. *immersum*.'— —. Correns, 'Zur biologischen Anatomie der *Aristolochia*-Blüte.'— —. Hartig, 'Ueber *Trametes radiciperda*.'

Botanical Gazette (March: issued April 12). — S. B. Parish, 'Botany of Slover Mountain.' — M. S. Bebb, 'North American Willows.' — F. Renault & J. Cardot, 'New Mosses of N. America' (2 plates).—D. C. Eaton, *Heuchera Williamsii*, sp. n.—J. N. Rose, 'Notes on some Western Plants' (*Chorizanthe Vaseyi* Parry & Rose (1 plate), *Erigeron Tweedyana* & *E. Parryi* Canby & Rose, *Pentstemon Tweedyi* Canby & Rose, spp. n.).

Bot. Zeitung (Nos. 13–15). — H. Solms-Laubach, 'Die Sprossfolge der Stangeria und der übrigen Cycadeen.' — (No. 16). P. Sorauer, 'Mittheilungen aus dem Gebiete der Phytopathologie.'

Bull. Torrey Bot. Club (April). — J. Macoun, 'Contributions to Canadian Bryology.' — N. L. Britton, Rusby's S. American Plants (new species of *Miconia* and *Clidemia*). — B. D. Halsted, 'A New

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[*] Journ. Bot. 1888, p. 261.

White Smut' (*Entyloma Ellisii*).—D. C. Eaton, *Bruchia longicollis*, n. sp. (1 plate).

Gardeners' Chronicle (April 5). — *Eucharis Bakeriana* N. E. Br., *Masdevallia Lowii* Rolfe, spp. nn. — W. B. Hemsley, 'The Genus *Asarum* (*A. geophilum*, *A. pulchellum*, *A. maximum*, spp. nn.).— (April 12). *Paulownia Fortunei* Hemsley, sp. n. — (April 19). C. T. Druery, 'Vagaries of Variation.' — (April 26). *Melhania melanoxylon* (fig. 81). — R. A. Rolfe, 'Hybrid Odontoglossums.' — W. G. Smith, 'Truffles.'

Journal de Botanique (Feb. 16).—N. Patouillard, 'Contributions à la Flore mycologique du Tonkin.'—C. Sauvageau, 'Sur la structure des feuilles des plantes aquatiques.'—B. Balansa, 'Graminées de l'Indo-Chine française.' — (March 1). P. Hariot, 'Sur le genre *Trentepohlia*.' — —. Hue, 'Lichens de Canisy.' — Memoir of E. Cosson (22 July, 1819—31 Dec. 1889).—(March 16). B. Balansa, 'Graminées de l'Indo-Chine.'—C. Sauvageau, 'Feuilles des plantes aquatiques.'— —. Hue, 'Lichens de Canisy.'

Journ. Linn. Soc. (xxvi. 174: April 12).—F. B. Forbes & W. B. Hemsley, 'Enumeration of Chinese Plants' (*Gentianaceæ–Pedalineæ*). (xxvii. 181: April 5). H. N. Ridley, 'Botany of Fernando Noronha' (*Oxalis sylvicola*, *Schmidelia insulana*, *Combretum rupicolum*, *Erythrina aurantiaca*, *Ceratosanthes angustiloba*, *C. cuneata*, *C. rupicola*, *Sesuvium distylum*, *Guettarda Leai*, *Palicourea insularis*, *Aspilia Ramagii*, *Bumelia fragrans*, *Jacquemontia euricola*, *Cuscuta globosa*, *Physalis viscida*, *Solanum botryophorum*, *Scoparia purpurea*, *Bignonia roseo-alba*, *Lantana amœna*, *Croton odoratus*, *Acalypha Noronhæ*, *Sapium sceleratum*, *Cyperus circinatus*, *C. vialis*, *C. Noronhæ*, *Paspalum anemotum*, *P. phonoliticum*, *Gymnopogon rupestre*, *Riccia Ridleyi* (Gepp), spp. nn.). —G. Massee, 'Monograph of *Thelephoreæ*, part ii.'

La Nuova Notarisia (April 10). G. B. De Toni & F. Saccardo, 'Revisione di alcuni generi di Cloroficee epitite' (3 plates). — A. Piccone, 'Noterelle ficologiche.'

Nuovo Giornale Bot. Ital. (April 1). — E. Taufani, 'Florula di Giannutri.'—S. Sommier, 'Della presenza di stipole nelle *Lonicera cærulea*.' — G. Cuboni, 'Osservazioni anatomiche sugli acini d'uva disseccati del "mal dal secco."'—C. Avetta, 'Contribuzioni alla flora dello Scioa.' — J. Bresadola, *Corticium Martellianum*, sp. n. — A. Bottini, 'Appunti di briologia italiana.' — G. Arcangeli, 'Sulle emergenze e spine dell' *Euryale* e sulle cladosclereidi delle Nimfeacee.'— Id., 'Sull' allungamento dei picciòli nell' *Euryale*.'— Id., 'Sulla struttura del frutto della *Cyphomandra*.'—C. Grilli, 'Licheni raccolti nell' Appenino Marchigiano.'—G. E. Mattei, 'Osservazioni sulla *Mina lobata*.'—A. Goiran, 'Di una nuova stazione italiana di *Galinsoga parviflora* ed *Eleusine indica*.'

Oesterr. Bot. Zeitschrift (April). — M. Willkomm, 'Ueber neue und kritische Pflanzen der Spanisch-portugieschen und balearischen Flora' (*Koeleria dasyphylla*, sp. n.). — J. Breidler, 'Beitrag zur Moosflora der Bukowina und Siebenbürgens.' — K. Rechinger, *Ballota Wettsteinii*, sp. n. (1 tab.). — J. Freyn, 'Plantæ Karoanæ.'

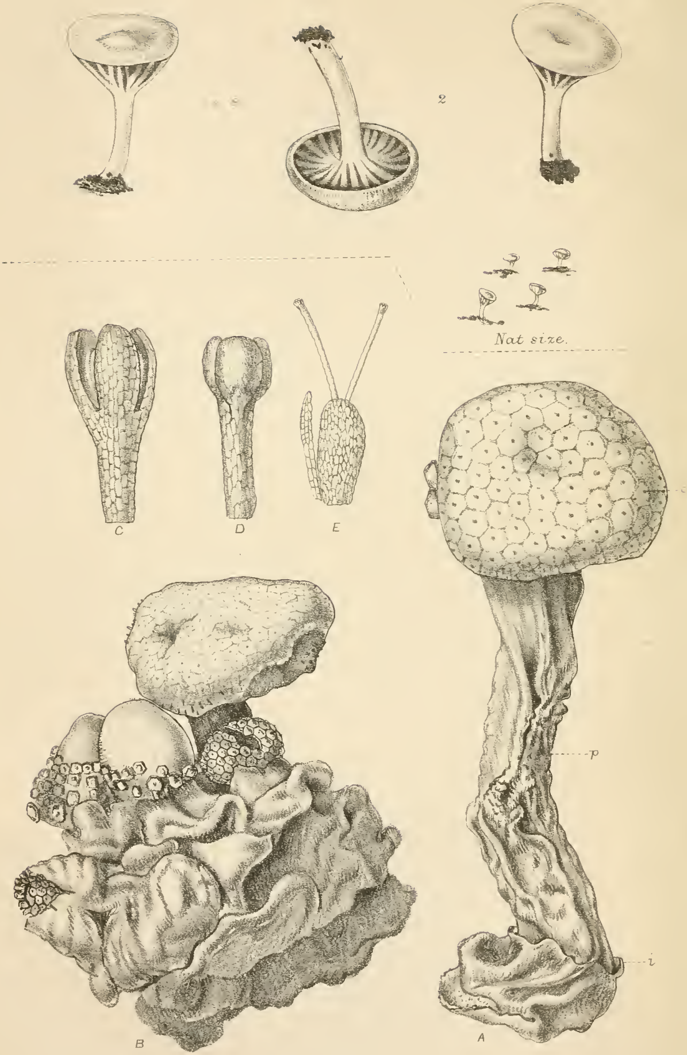
H. Braun & G. Sennholz, '*Calamintha mixta* (*C. alpina* × *Acinos*).' —K. Bauer, 'Untersuchungen über gerbstofführende Pflanzen.'—E. v. Halácsy, 'Beiträge zur Flora der Balkanhalbinsel' (*Polygonum longipes*, *Galium Baldaccii*, spp. nn.)—B. Stein, '*Petasites Kablikianus*.' —R. v. Wettstein, 'Ueber das Vorkommen von *Trochobryum carniolicum* in Südserbien.'—'Flora von Oesterreich-Ungarn.'

LINNEAN SOCIETY OF LONDON.

April 3, 1890. — Mr. W. Carruthers, F.R.S., President, in the chair. — Mr. John Low was admitted and Rev. J. Scott elected a Fellow of the Society.—Mr. B. D. Jackson exhibited some seeds of *Mystacidium filicorme*, an epiphytic Orchid forwarded from South Africa by Mr. Henry Hutton, of Kimberley.

April 17.—Mr. W. Carruthers, F.R.S., President, in the chair. —Messrs. E. C. Galpin, J. Johnson, W. F. Kirby, J. B. Carruthers, and J. S. Turner were elected Fellows of the Society.—Lord Arthur Russell, on behalf of the subscribers to a portrait of Sir Joseph Dalton Hooker, which had been painted at their request by Mr. Hubert Herkomer, R.A., formally presented the portrait to the Society, and in a few words expressed the satisfaction which he was sure would be felt at the acquisition of the likeness of so distinguished a botanist. It was announced that a photogravure of the portrait was in preparation, of which a copy would be presented when ready to every subscriber to the portrait fund.—Dr. Edward Fischer, of Zurich, exhibited and made remarks on certain species of *Polyporus* bearing a sclerotium possessing the structure of *Pachyma Cocos*, but it was doubtful whether the *Polyporus* represented the fructification of the *Pachyma*, or was merely parasitic on it. Mr. George Murray expressed himself in favour of the latter view. — A paper was then read by Mr. Spencer Moore, "On some micro-chemical reactions of Tannin." In this an account was given of the behaviour of Nessler's test for ammonia upon tannin, which it usually colours almost immediately some shade of brown or reddish brown. The great value of the reagent is held to reside in the rapidity of its action; moreover, in none of the many experiments did it fail. Reference was also made to some other new tannin tests, especially to some in which, as in Nessler's fluid, caustic potash furnishes the basis, and which, like that fluid, are very rapid in their action.

We are glad to announce that our valued correspondent, Mr. J. E. Bagnall, A.L.S., who has worked so long and so carefully at Warwickshire Botany, has almost ready for the press a new 'Flora of Warwickshire,' which will be issued with as little delay as possible. The work will be limited to 500 copies, and will be published at a subscription price of 12*s*. 6d. Subscribers' names should be forwarded to the author, 84, Witton Road, Aston, Birmingham.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R. Morgan lith.

West, Newman imp.

1–2 Cantharellus Whymperi, *Murr & Mass.*
A–E. Helosis Whymperi, *Bak. fil*

NEW PLANTS FROM THE ANDES.

By Edmund G. Baker, F.L.S.

(Plate 297).

Among the plants collected by Mr. Edward Whymper in 1880, on the Andes, and recently worked out at the British Museum, was the following new species of *Helosis*:—

Helosis Whymperi, n. sp. — Rhizoma deforme globosum lobatum, pedunculi erecti basi involucello annulari donati, capitula sphærica vel elliptica androgyna filis articulatis operta juniora squamis peltatis hexagonis vel pentagonis velata, fl. ♂ perianthium tubulosum, limbi lobis 3-valvatis, antheræ 3, filamentis brevissimis, fl. ♀ sessiles, ovarium oblongum obtusum compressum, styli 2 filiformes, ovulum 1 pendulum.

Hab. Machachi, eighteen miles south of Quito, Ecuador. Alt. 9800 ft.

Measurements. Peduncle: length, 1–3 in.; diameter ½ in. Capitula: diameter, 1–1¾ in. Scales: diameter, ⅙ in.

These measurements are taken from dried specimens.

This very distinct species of *Helosis* differs from the other members of the same genus in its large, tuberculated and consolidated rhizome resembling *Corynæa.* The floral structure, however, is that of a *Helosis*, the perianth of the male flowers having three distinct segments and not being campanulate, and the stamens are divided a short distance below the anthers. In its floral characters then it resembles *Helosis*, and in its rhizome *Corynæa;* it is therefore interesting as forming a connecting link between these two genera.

The capitula contain both male and female flowers, and are proterogynous; the female flowers protrude their styles from the dense mass of subjacent articulate threads immediately on the fall of the scales. The male flowers, as just mentioned, have the filaments free a short distance below the anthers, and these latter burst introrsely. I am not aware that any species of *Helosis* have been described since Sir J. D. Hooker's revision of the genus in the 'Transactions of the Linnean Society,' xxii. pp. 55—60. This will therefore make the third, the others being *H. guyanensis* Rich., and *H. mexicana* Lieb.

The following list of Fungi may be of interest, since the specimens were collected by Mr. Whymper at a great elevation, in an equatorial region. They have been named by Mr. Massee and Mr. Murray:—

Omphalia umbellifera Fr. In Monte Antisana, Ecuador, 13,000 ped. alt. No. 1512 A.

Agaricus sagatus Fr. Machachi. No. 1320.

Psilocybe sp. In Monte Antisana, Ecuador, 13,000 ped. alt. No. 1512 A.

Cantharellus Whymperi, n. sp., Mass. et Murr.—Cinereus, pileo e convexo explanato, carnosulo; lamellis integris vel dichotomis, angustis, distantibus, decurrentibus, acie obtusissimo; sporis ignotis; stipite solido, glabro, æquali vel basi attenuato, ·5 cm. long., 3 m. lat.

Ad terram, Monte Pichincha, Ecuador, 15,300 ped. alt. No. 1537.

Fomes senex N. et Mont. Machachi. No. 1380.

Eurotium herbariorum de By. In specim. *Fomis senis* (No. 1380). The specimens were put in spirit when gathered; we may thus regard this as a true record of *Eurotium*.

Description of Plate.—a, *Helosis Whymperi*, nat. size; $c =$ capitulum, $p =$ peduncle, $i =$ involucre. b, rhizome with shoots. c, male flower, magnified. d, same, without perianth, *i.e.*, stamens. e, female flower. 1, *Cantharellus Whymperi*, nat. size; 2, same, × 8.

NOTES ON A NEW SUBSPECIES OF *EUPHRASIA OFFICINALIS* L.

By Frederick Townsend, M.P., M.A., F.L.S.

Many subspecies of the genus *Euphrasia* are alpine, and are in perfection in autumn when most of the flowering plants of the Alps are past and in seed, or have been devoured by the cows and goats. The Eyebrights are evidently distasteful to these animals as they pass them by untouched, hence the botanist who visits the Alps in autumn will always find specimens in abundance, even in the higher Alps, far above the limit of the pines. Latterly, my visits to the Swiss Alps have been late in August, and during the first two weeks of September, so that I have had special opportunity of studying some of the subspecies of this to me very interesting genus.

In 1874, I found at Mürren, at an altitude of about 6400 feet, and again at about 8000 feet, a plant which considerably puzzled me. I then supposed it to be a hybrid, or a var. of *E. minima* Schleich., and I so named it in my paper on *E. officinalis* L., published in the 'Journal of Botany' for June, 1884. Last year I spent several weeks at Mürren, where, after careful study of all the forms of *Euphrasia* which occur in that neighbourhood, I became convinced that my plant was neither a hybrid nor a var. of *E. minima*, but either a new var. of *E. hirtella* Jord., or a new subspecies; and that this form, found abundantly in company with that very variable subspecies *E. minima* Schleich., had hitherto been confounded with it. I drew up the characters of my plant and named it *E. hirtella* Jord., var. *capitulata*, from the upper bracts and flowers being crowded, and the latter collected together at the summit of the stem. I sent a series of specimens to Mons. Auguste Gremli, author of 'Excursionsflora für die Schweiz,' and he wrote as follows:—"*E. capitulata* me parait maintenant une bonne variété, ou plutôt, une sous-espèce voisine de *hirtella*. On l'a confondu probablement, surtout les petits exemplaires, avec le *minima*, mais les caractères tirent evidemment plus vers le *hirtella*. Le nom *capitulata* me parait bien choisi : les petits exemplaires montrant les feuilles inférieures distantes entre elles comme dans le *minima* les supérieures avec les fleurs ramassés vers le sommet de la tige."

Towards the end of August, last summer, I had again the opportunity of revisiting the ground on which I first noticed the plant, and I found it abundant and exhibiting exactly the same characters. A little later in the season I went to the Grosse Scheideck, between Grindelwald and Rosenlaui, and I wrote the following notes on the evenings of the 6th, 7th, and 10th of September :—

"Sept. 6th. To-day I ascended the Grosse Scheideck, and found, in considerable quantity, on the slopes below the hotel, and from this to about 200 feet below it, a small form of *Euphrasia*, which I at first took for *E. capitulata* mihi, but eventually recognised as a dwarf form of *E. hirtella* Jord. This dwarf form has pale green foliage, and the lower lip of the flowers is white or pale yellowish white ; in size the plant is somewhat taller than *E. capitulata*, the lower leaves and bracts are more distant, and these as well as the upper bracts are much broader, being almost orbicular, and with cordate base.

"Later on I came upon a few specimens of my *E. capitulata*, which occurs but sparsely about here, and sometimes without any glandular hairs. I found I could readily distinguish this eglandular form from purple-flowered *minima* by the spreading jointed hairs on the stem, those in *minima* being adpressed, and faintly, or not at all, jointed. This spot seems to be good botanizing ground, as it is broken and rocky, and water collects plentifully in several hollows, forming small pools in which *Eriophorum Scheuchzeri* Hoppe grows abundantly.

"Sept. 7th. To-day I explored the broken ground to the east of the hotel, and here I found a taller plant which I knew to be the normal form of *E. hirtella.* The small *hirtella* which I noticed yesterday was until this year new to me. I think it likely that botanists have passed it by as a form of *E. minima*, and that when recognised as small *hirtella*, it will be found that this subspecies is more generally distributed than is usually supposed. I recollect having noticed it above Mürren, and between the Wengern Alp and the village of Wengern. I am now convinced that *E. capitulata* must be looked upon as a distinct subspecies of the Hirtellæ group, and not as a variety of *E. hirtella* Jord. The hairs on the stem of *hirtella* and of *capitulata* are very variable in length, and are jointed distinctly ; some are spreading, and some are at first spreading and afterwards curved downwards, but they are not adpressed. The hairs on the stem of *minima* are short, very indistinctly or not at all jointed, and they are curved downwards and adpressed to the stem. The veins of the calyx of *E. minima* are very frequently dark purple. I have never seen those of *E. capitulata* other than green with purple spots, but the intermediate spaces between the veins have frequently dark purple streaks or blotches.

"When, as I have already remarked is sometimes the case, *E. capitulata* is eglandular, it may at first sight be taken for broad-leaved purple-flowered *E. minima*, but the long jointed and not adpressed hairs on the stem, and the horizontal direction of the flowers of *E. capitulata* will distinguish it. The presence of glandular hairs is not constant, apparently, in any subspecies of *Euphrasia*. Though glandular hairs are characteristic of *E. Rostkoviana*, Hayne, *E. hirtella* Jord., and *E. capitulata* mihi, yet eglandular forms of these three subspecies do occur. There are, however, other peculiarities in the pubescence which appear more constant; such are the long jointed hairs found in all the three last-named plants, though even these are sometimes absent as in the high alpine forms of *capitulata* and of *Rostkoviana*, the latter being named by Gremli, *Euphrasia anadena* (= *Euphrasia Rostkoviana β. alpestris* Gremli, olim) in his 'Neue Beiträge zur Flora der Schweiz,' Heft 4, Aarau, 1887.

"Sept. 10. To-day I walked from the Grosse Scheideck to the Faulhorn. The road, at first, is nearly level for a considerable distance, but afterwards ascends within sight of the Hotel of the Grosse Scheideck, and about three quarters of an hour's walk from the latter. On the wet alpine pastures, soon after commencing to ascend, I found *E. capitulata*, small forms of it, about 1¼ inches high; further on the plant occurred abundantly, and I noticed it all the way onwards till within half an hour's walk of the Faulhorn Hotel. I was thus able to gather abundant specimens of this interesting plant. It has, here, the dark-green foliage which I noticed as so characteristic when I first found it at Mürren. *E. minima* Schleich., occurs here abundantly also, and in company with *E. capitulata*. On the slopes, where the road passes close to a fence, about one hour's walk from the Scheideck, and on the south side of the fence, I found large plants of *E. hirtella* Jord., with its characteristic pale green foliage and pale flowers. *E. capitulata* evidently prefers the wetter spots and *E. hirtella* the drier ground. The bracts of *E. hirtella* are broader than those of *E. capitulata* and more or less cordate at the base; the tips of the leaves and bracts have not the same tendency to curve downwards as in *E. capitulata*. The upper bracts of the latter have a more or less cuneate base."

I have drawn up the following description of *E. capitulata*:—

Euphrasia capitulata mihi, nova subspecies = *E. minima* var. *intermedia* Towns. (Journ. of Bot. 1884, p. 167).

Racemo pilis longis patentibus articulatis glandulosis eglandulosisque, e basi nigrâ ortis, obsito; caule crasso *humili* unciali ad tres uncias, simplice vel raro infra ramoso, *pilis crispulis non adpressis* pilisque longis glandulosis eglandulosisque promiscue pubescente; *foliis et bracteis* ovatis vel late ovatis *patentibus atro-virentibus*, *pagina inferiore plicato-costatâ*, dentatis, dentibus ab utroque latere quatuor ad sex obtusis, *bracteis superioribus imbricatis*, basi cuneata, dentibus acutis; calyce glanduloso nervis virentibus sed pagina inter nervos sæpe purpureo-maculosâ; *corolla parva*, fauce flava, *tubo incluso*, labio superiore lilacino inferiore magis pallido vel albo-

lilacino trifido, laciniæ mediæ lobulis subdivergentibus *stylo antice deorsum redunco; capsulâ obovato-ovali emarginata* mucronatâ dentes calicinos æquante aut superante, *bractea sua superatâ.*

Perennis, floret Augusto et Septembri. Frequens in pascuis humidis alpinis et subalpinis Helvetiæ, ad altitudinem sex millium trecentorum ad octo millium quingentorum pedum supra mare, ut supra Mürren, circa Scheinige Platte et Grosse Scheideck, inter Grosse Scheideck et Faulhorn, &c.

Var. *glabra*, planta humilior, pilis glandulosis nullis. In locis apricis circa octo millia pedum supra mare prope Mürren. Exempla hybrida inter *E. capitulatam* et *E. minimam* inveni.

Observationes. Pagina superior foliorum et bractearum rugosa inferior plicato-costata est. Flores plerumque directionem horizontalem habent et juxtapositio florum bractearumque talis est, ut videantur flores quasi adpressi. Nervi calycis virentes sunt et pagina inter nervos sæpe atro-purpurea maculosa est. Pili longi et glandulosi plerumque e basi nigra oriuntur. Folia et bracteæ decussatim oppositæ ita ut racemus formam quadrangulam præbeat. Folia et bracteæ exemplarum pusillorum dentes pauciores habent.

E. capitulata adhuc cum *E. minima* Schleich. haud dubie confusa est, differt pilis longis articulatis et glandulosis, pilis crispulis non adpressis pubescentibus, bracteis aggregatis et imbricatis, paginâ superiore rugosa, inferiore-plicato-costata, floribus nunquam flavis, dente terminali foliorum et bractearum minus lato et obtuso, calycis nervis virentibus, in *E. minima* sæpe nigro-purpureis. Bractea capsulam superat. In *E. minima* capsula bracteam superat.

E. capitulata ab *E. hirtella* Jord., quæ propinqua, differt pubescentiâ minus copiosâ foliis bracteisque atro-virentibus, staturâ humiliore, floribus lilacinis bracteis ovatis superioribus basi cuneatis. Color foliorum et bractearum in *E. hirtella* flavo-virens, corollæ autem labii superioris pallido-lilacinus, inferioris albo-flavus, folia bracteæque multo latiores sunt, et sæpe sub-cordatæ. Duo subspecies supersunt cum quibus nostram plantam comparare necesse est, *E. pumila* Kerner (in ‘Schedæ ad flor. exsicc. Austro-Hungaricam’ i. (1881), pp. 43, 44) et *E. drosocalyx* Freyn (in catal. de la Soc. Helv. pour l’échange des plantes, 1885). *E. pumila* non nisi in Tyrolo inventa est. Habet bracteas dentibus subradiantibus elongatis triangulari-lanceolatis in mucronem subulatum rigidum productis. Habet flores maculâ flavâ carentes. Capsulam truncatam dentes calycis superant. *E. drosocalyx* quæ in alpibus Carinthiæ occurrit, ad *E. capitulata* maxime propinqua, differt bractearum dentibus paucioribus, bractea capsulam suam non excedente, foliis bracteisque angustioribus et obtusius crenatis.

SHORT DESCRIPTIVE NOTES ON THREE RUBI.

By W. O. Focke, M.D.

I have been asked to supplement my ‘Notes on English Rubi,’ printed in the April and May numbers of this Journal, by some descriptive remarks on three of the plants referred to, viz., *R. pul-*

cherrimus, *R. anglosaxonicus*, and *R. viridis*. For fully detailed descriptions I must refer my readers to—F. W. C. Areschoug, 'Some Observations on the Genus *Rubus*' (Lund, 1885–86); Friderichsen and Gelert, 'Danmarks og Slesvigs Rubi,' in Bot. Tidsskr. (pp. 46, 65), tom. 16 (1887); Focke, 'Synops. Rubor. Germ.,' pp. 368, 369 (*R. viridis* and *incultus*).

RUBUS PULCHERRIMUS Neuman (1882). *R. polyanthemos* Lindeb. (non *polyanthus* P. J. Muell.). *R. Neumani* Focke. — Hooker's name *R. pulcherrimus*, being a synonym of *R. lineatus* Reinw., must be dropped, and therefore the plant can bear the name given by Neuman.

The Swedish authors assert that in their country this bramble keeps quite distinct from *R. Lindebergii* P. J. Muell. Either species agrees exactly with forms placed under *R. umbrosus* by English botanists. *R. pulcherrimus* bears more or less numerous (often a few scattered only) glandular setæ on the panicle; its prickles are of a moderate size; and in a living state it will be distinguished from the true *umbrosus* at first sight by its pink flowers. The two species or varieties agree in the roundish shape and the small superficial dentition of the leaflets. A careful examination of the living plant will show if it can be separated from the eglandular white-flowering *umbrosus*.

R. ANGLOSAXONICUS Gelert. — By many characters this species seems to be intermediate between *R. mucronatus* and *R. Radula*. Usually the stem bears a good many aciculi, which are often somewhat unequal in size, but always very distinct from the strong prickles confined to the angles. The leaves are ternate or pedato-quinate, the leaflets coarsely serrate and generally white-felted beneath, the terminal one ovate or elliptic, with a short point. After flowering, the sepals are patent. The inflorescence is very glandular.

The stems of *R. Radula* are much rougher, from numerous equal aciculi; its leaflets are narrow and acuminate; and its sepals are usually reflexed. *R. mucronatus* will be easily distinguished by the shape and serrature of its leaflets.

R. VIRIDIS Kaltenb. (1845). — This species recalls typical *R. pallidus* W. et N., but it may be easily distinguished by its unequal prickles. The true *R. pallidus*, a rare plant in England, belongs to the *radula* group, and bears nearly equal prickles well discriminated from the aciculi. *R. viridis* might, I think, be put by Professor Babington under his *R. Kœhleri* var. *pallidus*; and indeed it is difficult to trace certain limits between *R. Kœhleri* and *R. viridis*, although the typical forms look very different. I consider the *R. incultus* Muell. et Wirtg. (1862) to be a more hairy and very prickly variety of *R. viridis*, and it is, I believe, much more frequent than the typical plant as well in England as in Western Germany. *R. viridis* and its allied forms are connecting links between the *Radulæ* and the *Glandulosi*.

ABERDEEN, FORFAR, AND DUMFRIES PLANT-NOTES.

By Edward F. Linton, M.A., and W. R. Linton, M.A.

The Dumfries plants here referred to were the result of a single day's observation near the sources of Moffat Water, taken on our return journey from the familiar haunts of Clova and Braemar, at each of which places we had about a week. The whole time was within the month of July, 1889; and as the season was unusually early, it was fortunate we did not start any later.

The county numbers are—Dumfries, 72; Forfar, 90; South Aberdeen, 92. We also note one or two plants for East Perth, 89, having driven through a portion of that vice-county between Clova and Braemar.

Plants hitherto unrecorded for the county or vice-county (so far as we are aware), are distinguished by an asterisk.

Subularia aquatica L., was growing on the margin of L. Brandy (90), not only in the water, but, owing to the dry season, on the mud from which the water had retired. The terrestrial plant was stouter and less drawn up than those under water, and was of a purplish hue; it evidently flourished on the damp mud, and fruited freely.

Polygala serpyllacea Weihe. Glens Doll and Fiagh (90), a form with the rachis pubescent and a certain amount of ciliation, varying, in different plants, on the upper part of the flowering stems. Mr. Arthur Bennett does not consider the plant to be the var. *ciliata* Lebel.—*Polygala*, sp. Braemar, in a rocky wood. Similar in habit to *P. vulgaris* L., but differing by its small flowers and remarkably narrow sepals. This we hope to get and cultivate, and will report on again later.

Cerastium arcticum Lange. Noticed in one spot only on Little Craigindal (92). A few strong plants and several seedlings.

Hypericum pulchrum L., *floribus ochroleucis*. Linn of Quoich, near Braemar (92).

Astragalus alpinus L., and *Oxytropis campestris* DC., were each growing in large quantity in their best known stations. The deer are extremely fond of both; and this, while it is rather a protection than otherwise to the *Astragalus*, is less so to the *Oxytropis*, plants of which are liable to be torn up by the teeth, or trampled out of the ground by the hoofs of the deer, where growing on the softer débris. There is plenty of it, however, on the rocky precipice above.

Vicia Cracca L., var. *incana* Thuill. Rough grassy bank in the Clova Valley (90). Identified for us by Mr. Arthur Bennett (to whom we owe many thanks for help in critical plants) as "*V. Cracca* L., f. *incana* Thuill." Nyman, however, gives it as a variety. The plant from Clova has a dwarf habit, many plants with two racemes in full flower being only a foot high; another specimen of a complete plant, bearing two racemes in fruit and two in flower, being but fifteen inches high. The stem is covered with short pubescence, which in the upper part is thick enough to give a hoary appearance. The peduncles are short and scarcely lengthen in fruiting; some in the fruiting stage do not reach two inches; whereas in *V. Cracca*, type, they develop from four to six inches. The hair on the upper part of the style is much the same, but rather denser in the variety. The leaflets are rather broader in proportion to length, and less acuminate, though equally mucronate. The dwarf condition is not merely due to a subalpine condition; a specimen of type *V. Cracca* was gathered at Braemar ten days later, growing much as usual, though at an elevation 700 ft. or 800 ft. higher than the Clova station.

Spiræa salicifolia L. Glen Isla, Forfar. A well-established escape in several parts of Scotland.

Rubus Koehleri Weihe, var. *pallidus*, Bab. Dry copse, Moffat Water (72).

Dryas octopetala L. Very fine on the rocky ledges of Little Craigindal (92).

Alchemilla vulgaris L., var. *montana*, Willd. Growing with the type, in some quantity over a piece of upland pasture near Braemar (92).

Rosa coriifolia Fr., var. *Lintoni* Scheutz. Near Braemar (92), whence first reported.

Epilobium angustifolium L., var. *brachycarpum* Leight. Whatever is settled regarding this dubious variety, there is no reason for looking on it as an introduced plant. The Rev. E. S. Marshall has already commented in these pages on our gathering it high up the Unich Water (90), some miles away from habitation and cultivation.—**E. obscurum* Schreb. Moffat Water (72).—*E. obscurum* × *palustre*. Moffat (72).

Galium Mollugo L. Growing in a hedge in the outskirts of Braemar (92); under which circumstances we cannot add anything to 'Topographical Botany,' where it is given for 92 "as a distrusted native."—***G. sylvestre* Poll. Rocky gorge of Grey Mare's Tail, Moffat Water (72). Rocks of Little Craigindal (92).

**Crepis hieracioides* Wald. & Kit. Moffat Water (72).

Hieracium nigrescens Willd. On the rocky precipice of the Dhuloch (92) were growing *three* differing forms, all of which go under what we are accustomed to regard as *H. nigrescens*, and every one of them differing from the monocephalous form gathered on Ben Hope, Sutherland, in 1886. We have first to learn what true *H. nigrescens* Willd. is. Then some of these distinguishable forms will be found worthy at least of varietal names.—*H. lasiophyllum* Koch., Bradoonie, Clova (90). There is also in this district a *pallidum* form, which is, perhaps, *H. crinigerum* Fries, which runs near *H. lasiophyllum*, and has at times been confused with it.—**H. argenteum* Fries. Grey Mare's Tail, Moffat Water (72). Rather scarce.—*H. aggregatum* Backh. Glen Fiagh (90); a scarce plant in Forfar.—**H. Farrense* F. J. Hanb. Glen Shee (89). We did not recognize this plant; it was detected among our unnamed Hawkweeds by Mr. F. J. Hanbury. It shows no variation from the Sutherland plant, and is an interesting extension southwards of a very local plant hitherto only known on the north coast of

Scotland.—*H. obtusifolium* Backh. This plant which Backhouse describes as from Clova, has practically not been re-discovered. It is not improbable that a *H. anglicum* form, with oval entire leaves and a yellowish green tint, which we have come across in 1884 and 1889, may be the plant which gave occasion to the description of this doubtful species.—*H. gothicum* Fries. Very abundant and fine last summer in the Clova Valley (90); and fine but scarce in Glen Shee (89).—*H. prenanthoides* Vill. In the gorge of the Grey Mare's Tail (72); gathered also by Dr. Davidson at Sanquhar two years ago, when it was first recorded for the county.—**H. umbellatum* L. Clova Valley (90).—**H. auratum* Fries. Unnamed specimens were shown us by Mr. J. T. Johnstone at Moffat (72) from that neighbourhood; and also sent previously to us by Dr. Davidson, from Sanquhar (72). We gathered this species at Clova also in 1887, when it was still regarded as *H. rigidum*, and recorded under this name in Backhouse's Monograph, and in 1889.

Veronica Beccabunga L. A very small form between two or three inches high grew beside a reservoir near Braemar (92), at an elevation of about 1400 ft.

Rhinanthus Crista-Galli L., var. *Drummond-Hayi* F. B. White, was the common and frequent form in Glen Doll and Glen Fiagh (90), and was also gathered in two different directions near Braemar (92).

**Calamintha Clinopodium* Benth. Steep rocks by the Grey Mare's Tail Waterfall (72); a dwarf form, usually about 8 in. high, with wiry rigid stem, and firm strongly nerved leaves.

**Betula odorata* Bechst., var. *parvifolia* Wimm. Glen Fiagh (90). This was named for us by Mr. Arthur Bennett.

Salix Myrsinites × *nigricans*. Glen Fiagh (90). Among several hybrid or uncertain willows gathered last year, this and another may be safely mentioned. We prefer to grow them for the most part, or obtain further material, that conjecture, however confident, may be backed by confirmatory evidence. This hybrid we gathered at the same spot in a previous year. It is evidently a blend with one of the narrow-leaved *Myrsinites* forms. The only *S. nigricans* that we observed either year in the same part of the glen was the type, which grew near at hand, fruiting freely. It is obvious that, since both these species vary much in some of their characters, the cross results where they occur are likely to present even greater variation.—*S. herbacea* × *Lapponum*. We have seen this on three different occasions in a corrie in the Clova district; but the material gathered in 1884 and 1887 was insufficient for proof, though conjecture was easy. Last summer we found stronger plants, growing close to where *S. herbacea* and *S. Lapponum* abounded, and no other likely parent was near. This was practically conclusive. Besides this, cuttings taken in 1887 have flowered at Bournemouth in May, 1890; the ovary is that of *Lapponum*, only smaller; the scale is nearer much to that of *herbacea;* so is the style, which seems to wither before it has energy enough to divide its stigmas, though this may be due to too dry a situation. The catkins are produced on leafy peduncles, and are embraced between the topmost leaves, as with *S. herbacea;* whereas *S. Lapponum* produces catkins before its leaves in its early flowering, though in alpine situations it is often found in fruit when the leaves are mature. The young leaves of the plant, as well as the mature foliage, are fairly intermediate between the two parents.

Malaxis paludosa Sw. In fair quantity in one spot in the Clova Valley (90).

**Juncus squarrosus* L. Moffat Water (72).

Potamogeton natans L. A starved form, growing in shallow muddy water near the reservoir, Braemar (92), at an altitude of about 1400 ft.—*P. polygonifolius* Pourr., form with narrow leaves. Peaty puddle near the last, and at the same altitude. Mr. Fryer said the fruit was not quite right for var. *angustifolius* Fries. Mr. A. Bennett said it was a form "*towards* var. *angustifolius* Fries."

Carex alpina Sw. Very fine in the same part of Glen Fiagh in which we have gathered it before. It is not unlikely that botanists who have failed to find it have been too late for it. The fruit was beginning to drop in the middle of July last year. In 1887, another forward season, it had disappeared by the middle of August.—**C. glauca* Murr. Grey Mare's Tail, Moffat Water (72).—*C. pilulifera* L. Form with long bracts and remarkably pointed glumes, the nerve being excurrent; Glen Fiagh (90), and near Dhuloch (92). This feature ought hardly to stand as a distinctive characteristic of *C. Saxumbra* Lees.—*C. Œderi* Ehrh. Clova (90). Named for us by Mr. Ar. Bennett.—*C. fulva* × *Œderi*. This hybrid was rather plentiful near Clova and Bradoonie (90). Both parents were growing freely about; but in the two spots the hybrid was the most prevalent. We recognized it without difficulty, and had the *flava* form named by Mr. Bennett, as above.—*C. fulva* × *flava* f. Meadow at Braemar (92). We did not take equal care to secure the *flava* parent in this case.

Deschampsia cæspitosa Beauv., f. *pallida* Koch. Clova Valley (90). Prof. Hackel has remarked on a Berkshire specimen of this form, considering it to be "not a variety, but only a shade-grown form." It appears to us nothing but an *albino;* not necessarily the result of shade, for our plant was in an open meadow.

Poa Balfourii Bab., var. *montana* Bab.? Unich Water (90). Specimens of this grass, which was new to us, were forwarded by the kindness of the Rev. E. S. Marshall to Prof. Hackel, who in an interesting note on the plant queried it as above; adding, "Had it grown on our Alps, I should have referred it without hesitation to *P. nemoralis*, var. *montana* Gaud., which it looks very much like."

Festuca rubra L., var. *grandiflora* Hackel. Rocky slope, Glen Fiagh (90). This also went to Prof. Hackel, unnamed, who settled it as above. It has a very different look from the maritime form, which was so named by Hackel for one of us from specimens from the Norfolk coast about four years ago.

**Brachypodium sylvaticum* R. & S. Moffat Water (72).

Cystopteris fragilis Bernh., var. *dentata* Hook. Rocky corrie, Clova (90). Name confirmed by Mr. J. G. Baker.

Lastræa Filix-mas Presl., var. *abbreviata* Bab. Grey Mare's Tail, Moffat Water (72).

Lycopodium annotinum L. On Little Craigindal (92), where it fruits freely. Elsewhere we have found it generally barren, or nearly so.

Chara fragilis Desv., var. *barbata* Gant. Peaty pools, Braemar (92). Name determined for us by Messrs. Groves.

CAREX RIGIDA GOODEN. AND ITS VARIETIES.

BY PROF. L. H. BAILEY.

MR. ARTHUR BENNETT's appreciative review of my paper on the "Types of Carex" in this Journal for 1889 (p. 330), calls for some remarks and explanations concerning *C. hyperborea*, *C. vulgaris*, *C. rigida*, &c. Mr. Bennett is puzzled to know what becomes of the Scottish plant which has been called *C. rigida* var. *inferalpina* Laest., inasmuch as I referred the var. *inferalpina* of Laestadius to *C. vulgaris* var. *hyperborea*. I am unable to throw any light upon the question, as I have not seen the Scottish plant; but the *C. rigida* var. *inferalpina* at Copenhagen, which I saw, is the same as Drejer's *C. hyperborea*. It is evident, however, that the plant which I examined at Copenhagen is not Laestadius's type, for Laestadius described his plant as *C. saxatilis* var. *inferalpina*. But the specimen is undoubtedly authentic.

Mr. Bennett writes:—"The confusion with *C. hyperborea* has been great; the true plant is only given as Faroen and Icelandic by Nyman; but Drejer, in his 'Revisio' (1841), says, 'Lapponia, Laestad.! in herb. Hornem.'" But Drejer says more than this. He credits the plant to Greenland, Faroes, and Lapland. I have seen Drejer's types at Copenhagen, and they are the same as the American plants from Mt. Washington and northward, which have been referred to the same species. In fact, I have before me, as I write, a good sheet of Vahl's collection in Greenland, in 1830, a part, as I suppose, of the very specimens upon which Drejer founded *C. hyperborea*, and I also have specimens obtained in Greenland by Rosenvinge in 1888; all of these are clearly the same as the American plant. My object in comparing these plants with the American is to confirm the correctness of Boott's reference of Drejer's *C. hyperborea* to the species represented by the name *C. vulgaris*. There is so gradual a blending of types from the top of Mt. Washington, where *C. hyperborea* grows, to the adjacent sea-coast, where *C. vulgaris* is common, that there can be no doubt as to the specific identity of the two plants. But the same thing may be observed in Northern Europe.

"In one instance Prof. Bailey is not consistent, *i. e.*, in retaining *C. vulgaris* Fr., for *C. Goodenovii* Gay, which name is certainly three years anterior to that of Fries." This criticism is perfectly just; but the difficulty extends beyond these two names, and if reform is to be undertaken it must begin fifty years farther back.

C. hyperborea is also older than *C. vulgaris*. It is the accepted practice, when combining specific names into a composite species, to erect the oldest specific name into the type. *C. rigida* should, therefore, be taken as the type of this species, for there can be no doubt, as Dr. Boott long ago showed, but that *C. rigida* and *C. vulgaris* are specifically one. Boott appears to have had it in mind to refer all the forms of the species to *C. rigida* rather than to *C. vulgaris*, for in his 'Illustrations' he frequently uses the former name in combination incidentally: but his characterizations are always drawn under the latter name.

The proper re-casting of the species would probably treat it about as follows:—

CAREX RIGIDA Gooden. Linn. Trans. ii. 193, t. 22 (1792).

C. saxatilis auct. Scand., not Linn.

C. saxatilis vars. *infuscata*, *pudica*, *lutosa*, Drejer, Revis. Crit. Car. Bor. 42, 43 (1841).

C. vulgaris var. *alpina* Boott, iii. 167 (1867).

C. Fyllæ Holm. Engl. Bot. Jahrbücher, viii. 294 (1887). Northern Europe, Scotland, and probably in the Rocky Mountain region of North America.

Var. BIGELOVII Tuckm. Enum. Meth. 19 (1843). *C. Bigelovii* Torr. Ann. N. Y. Lyc. i. 67 (1824). *C. Washingtoniana* Dewey, Sill. Journ. (I.), x. 272 (1826). *C. saxatilis* var. *Bigelovii* Torr. Monogr. 397 (1836). *C. saxatilis* var. *inferalpina* L. L. Laestadius, Loca Parall. Pl. 287 (1839). *C. hyperborea* Drejer, Revis. Crit. Car. Bor. 43 (1841). *C. Fridrichsthaliana* Steud. Pl. Cyper. 211 (1855). *C. dubitata* Dewey, Wood's Bot. 1861, 755. *C. vulgaris* var. *hyperborea* Boott, iii. 167 (1867). *C. Warmingii* Holm. Engl. Bot. Jahrbücher, viii. 294 (1887). Lapland, Faroe, (Scotland ?), Iceland. Greenland, and southward in America to Mt. Washington, and evidently also in the Rocky Mountains.

Var. GOODENOVII.—*C. acuta β.* Linn. Fl. Suec. ed. 2, 334 (1745). *C. acuta* a. *nigra* Linn. Sp. Pl. ed. 1, 978 (1753). *C. cæspitosa* Gooden. Linn. Trans. ii. 195, t. 21 (1792). *C. Goodenovii* Gay, Ann. Sci. Nat. (II.), xi. 191 (1839). *C. vulgaris* Fries, Mant. iii. 153 (1842). Northern Europe and Asia, and along the North Atlantic seaboard in North America.

Var. STRICTIFORMIS.—*C. Limula ?* Gray, Man. ed. 5, 582 (1867). *C. vulgaris* var. *strictiformis* Bailey, Mem. Torr. Club, i. 74 (1889). Near the seaboard from Pennsylvania northward to Canada.

Var. LIMULA. — *C. limula* Fries, Summa, 229 (1846). *C. vulgaris* var. *hyperborea* (*limula*) Boott, iii. 169 (1867). Scandinavia.

Var. ELYTROIDES. — *C. elytroides* Fries, Summa, 232 (1846). *C. vulgaris* var. *elytroides* Boott, iii. 168 (1867). Near the seaboard from Holland northward.

Var. TRICOSTATA.—*C. tricostata* Fries, Mant. iii. 152 (1842). *C. vulgaris* var. *tricostata* Boott. iii. 168 (1867). Scandinavia.

Var. JUNCEA. — *C. vulgaris* var. *juncea* Fries, Mant. iii. 154 (1842). *C. vulgaris* var. *juncella* Fries, Summa, 230 (1846). *C. angustifolia* Smith, Engl. Fl. 127 *teste* Boott. Great Britain and Northern Europe.

Var. TERES.—*C, vulgaris* var. *teres* Boott, iii. 168, (1867). From Germany northward.

Var. TURFOSA. — *C. turfosa* Fries, Summa, 228 (1846). *C. vulgaris* var. *turfosa* Boott, iii. 169 (1867). Scandinavia.

Var. BRACTEOSA.—*C. vulgaris* var. *bracteosa* Bailey, Proc. Amer. Acad. Arts and Sci. xxii. 81 (1886). California. Greenland.

C. Gaudichaudiana Kunth, which Boott makes a variety of *C. vulgaris*, appears, from the little material which I have seen, to be at least a very doubtful variety of this species, and for the present it had probably better stand alone.

SUPPOSED HYBRIDITY IN *POTAMOGETON*.

BY ALFRED FRYER.

WHEN I first began to study local forms of *Potamogeton* in the Fens, I was strongly prejudiced against regarding any of the generally accepted species of authors as of possible hybrid origin, but supposed that such species as are described in our standard works were in all cases "good species," which especially fulfilled the first theoretical demand of a species by being sterile with all other species of the genus. If on rare occasions a cross ever occurred, I held that the consequent offspring was absolutely barren, and incapable of continuing its race except by "extension" or growth from the original plant. Indirectly, these views were, if I remember rightly, advocated in the earlier notes of this series. By degrees, however, the local facts that presented themselves compelled me to regard *P. decipiens* as a hybrid between *P. lucens* and *P. perfoliatus.* This conclusion, by no means hastily made, induced me more closely to examine the local distribution and life-history of other so-called species of *Potamogeton*, and more especially to inquire into such circumstances as seemed to throw any light on their origin, or the relationship they bore one to another.

The facts observed in the course of these investigations, and the conclusions I have arrived at, form the substance of this note. By stating the facts fairly, I hope to enable the reader to correct for himself any errors of inference I may have fallen into.

In a previous note I stated that such forms as *P. heterophyllus* and *P. Zizii* were as variable when growing apart as when growing together. This statement was altogether erroneous. I did not then understand the difference between *states* of species and *varieties* of species,—between forms that are only temporary and speedily revert to the type, and forms that are permanent, for the life of the individual at least. But continued study of the living plant of one of our most apparently variable races of *P. Zizii*, showed that this multiform plant has no true variety, in the botanical sense of the word, but that all its forms may be produced on the same rootstock, often in a single season, or at most in the course of three or four seasons, and that these forms are mere states due to temporary causes, such as varying depth of water, or a greater or less degree of temperature, or whether they grow in stations crowded with other plants.

This race of *P. Zizii*, which grows in Westmoor, in the parishes of Chatteris and Doddington, extends over four or five square miles of the Fen, so that the constantly varying conditions of the numerous mill-drains and smaller ditches it inhabits afford unusually favourable opportunities for its study. Some ditch is constantly growing up, or some drain is deepened, or new ditches and drains are sometimes made, so that the deep-water *lucens*-like form of one year, or of early spring, may become the shallow-water *heterophyllus*-like form of another year, or of late summer in the same year even. Now on this west side of the Island of Chatteris no *Potamogeton heterophyllus* is at present to be found. *P. Zizii* has *lucens*, *natans* and *perfoliatus* as its usual companions.

Such forms as *P. varians* and *P. coriaceus*, both probable hybrids between *Zizii* and *heterophyllus*, therefore ought not to occur in Westmoor, and do not. But, on the other hand, a single plant of *P. decipiens* (*lucens* × *perfoliatus*), apparently a seedling, has been found, and also another *decipiens*-like form, in a single plant, which suggests *Zizii* × *perfoliatus*. One other probable hybrid has also occurred: *P. fluitans*, or *lucens* × *natans*.

This latter form occurred in two distant places, in single plants in each locality only, as if only recently introduced, or sprung from seeds.

Now if we turn to the east of Chatteris, we come to a district called Block Fen and Witcham Meadlands. In both these localities *P. Zizii* and *P. heterophyllus* are found constantly growing side by side, over an area of about the same extent as the Westmoor *P. Zizii* occupies. Here we find very different results; both *P. varians* and *P. coriaceus* occur plentifully, and *P. Zizii* and *P. heterophyllus* both produce numerous permanent forms, some of which are almost undoubtedly hybrids. In one drain between Block Fen and Witcham Meadlands ("Broker's Drain" of my labels), almost every group of *P. Zizii* and *P. heterophyllus* seems to be distinct from its neighbouring group; some forms appear to be exactly intermediate, others approach more nearly to one or other of the supposed parents; but few of them seem to be *states*, as I have not found them to revert to either of the type species, but they remain constantly distinct from one another through the most varying conditions. Some of these forms are no doubt true *varieties*, but others are quite as certainly hybrids, or double hybrids between *Zizii* and *heterophyllus*.

Although for a year or two past I had begun to suspect a remarkable form growing in Broker's Drain to be of hybrid origin, it was not until the summer of 1889 that I succeeded in obtaining what seems to be a direct proof of the hybrid parentage of any one individual.

For three or four years I had watched the growth of a slender plant, apparently a seedling, also growing in Broker's Drain, and had placed it in its immature state as a form allied to *P. heterophyllus* var. *fluctuans* of Tiselius; the plant had not flowered, nor produced floating leaves, but gradually extended itself year by year until it began to form a little colony or bed sufficiently strong to keep out other forms of the genus from intruding on its territory. Its exact station was sufficiently fixed in my memory by the fact of its occupying a clear space of water between two local forms of *P. Zizii* and *P. heterophyllus.* In June of 1889 I visited this drain for the first time that season, and was greatly surprised to see a new form of *Potamogeton* quite unknown to me. I thought I knew each individual plant in Broker's Drain as well as I knew each individual face in the circle of my friends, for I had watched and gathered specimens of each local form and of almost every individual plant for four or five years, yet here was something quite new and which I could not refer to any segregate known to me. Hastily fishing a plant up, the lower leaves of the stem at once showed that it was the supposed seedling I had referred to *P. fluctuans.* The next point was to make sure of the exact locality by examining the plants on either side, and I found the beds of *Zizii* and *heterophyllus*, both of which I know perfectly well. Now this new form of *P. fluctuans* was not like the other forms I had referred to this segregate, except in the lower leaves, but was curiously intermediate between the local forms of *P. Zizii* and *P. heterophyllus* which grew on either hand. Perhaps it is hardly possible to obtain a stronger proof of a natural hybrid or cross-bred plant than this instance affords. It seems to me only less strong than would be the case if such a form had been obtained artificially, by actually crossing the *Zizii* and *heterophyllus*-forms.

Unfortunately the drain was cleared of weeds in the ensuing wet July, before the plant had time to produce fruit, which, I think, from the appearance of the abundant flower-spikes, it would have done.

The original Scandinavian form, named by Dr. Tiselius, "*P. heterophyllus* Schreb. v. *fluctuans* mihi," certainly fruits readily. I have always considered it to be a hybrid between *heterophyllus* and *Zizii*, approaching more nearly the former plant. I sent Dr. Tiselius one of the forms from Broker's Drain, labelled "*heterophyllus* × *Zizii*," on which his comment is, "resembling *fluctuans* Tis.," . . . "possibly *Zizii* × *heterophyllus* (as) observed by you." This second *fluctuans*-form fruits freely with us, but perhaps less so than either of its supposed parents.

Having thus convinced myself that these two forms, *P. Zizii* and *P. heterophyllus*, do interbreed, I next turned my attention to the local circumstances in which *P. varians* grows, and to the variations it undergoes, both independently of, and in connection with, those conditions. I had previously suspected the hybrid origin of *P. varians*, as my published note on that segregate will show,* but now I began to push my researches in a fresh direction with some degree of confidence. This was to observe whether any variation had resulted from propagation by seed, or otherwise, in a colony of *P. varians* which grew apart from both *Zizii* and *heterophyllus*, and offered an unusually favourable opportunity of seeing what a single plant of a supposed hybrid would do when left to itself.

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* Journ. Bot. 1889, 35.

In 1880 I found a single plant, or small patch, which had the appearance of having sprung from a single rootstock, of what I then supposed to be *P. heterophyllus*, growing in Blockmoor, near Mepal. After a few years I found, on revisiting the locality, the little patch had spread until it more or less covered about a hundred yards in length of the ditch in which it grew. But the plant had now varied slightly from the first gathered specimen, and I thought it to be a *variety* of *heterophyllus*. Still there was nothing very striking about it. In the year 1886 I noticed for the first time the plant had begun to fruit somewhat freely; the ditch having been frequently dry between 1880 and 1886, probably greatly interfered, if it did not entirely prevent fruiting during that period. I gathered several specimens in the latter year, and found them very uniform in character. The next year, however, numerous young plants, apparently seedlings, began to spring up all over the ditch, presenting an astonishing variety of forms. At this time I supposed some of these forms to be *P. Zizii*, and others good *heterophyllus*, while yet other forms seemed distinct from either of these plants.

More careful study, and the discovery of *P. varians*, of Morong, in another locality, led me to suspect this colony to consist entirely of *P. varians*, of which a single seed or plant had been transported from its head-quarters some mile or so off. (Outliers from the head-quarters of a local form are frequently met with at short distances in the Fen, but I know of no instance of this "accidental" transportation for long distances, though it must occur at times). The identification with *varians* proved to be correct, for our typical colony of *varians*, named by the Rev. T. Morong himself, has since sprorted by seed and extension into a similar, though less numerous, set of varieties.

Here then we have exactly the results that occur when gardeners cross *Pisum satium* with *P. arvense*,—*variation by extension, and variation by seed without any further cross.* This Blockmoor colony of *P. varians* sprang from a single plant, and it varied both by extension and from seed just as many artificially cross-bred forms do.

Many botanists who may be inclined to think that I have fair grounds for supposing that *P. Zizii* and *P. heterophyllus* do frequently cross, with one another, or with *lucens* and the more recently proposed segregates, will urge that the resulting forms are not true hybrids at all but only *mongrels*, inasmuch as all the forms under consideration are varieties of one species. This may be so; I do not hold quite the same view myself, now regarding *P. lucens* and *P. heterophyllus* as not having descended one from the other, but that the intermediate forms are the result of repeated crosses. Whatever rank the above forms may hold, I think, however, no one will regard *P. natans* and *P. lucens* as anything but species widely distinct; yet these two forms seem to cross with the result of producing a plant, *P. fluitans*, which is said by some botanists to be occasionally fertile. As far as my observations go, the plant regarded by authors as the *P. fluitans*, of Roth, is a barren hybrid, and the fruiting form called *P. fluitans* is a distinct species. Hybrids usually barren do, however, occasionally bear fruit. By the kindness of Messrs. Bennett and Beeby, I possess fruit of "*P. fluitans*" from four different continental localities; these fruits seem to fall under two forms, one of which the accompanying foliage shows to be the form I regard as a distinct species, the other may be fruit of the plant of Roth, but foliage is wanting to prove this. All I can at present claim, with any degree of certainty, is that *P. fluitans* of the Fens is a hybrid between *P. natans* and *P. lucens*. It never occurs but in *single plants*, and in localities so far apart as to render it extremely improbable that fragments of living plants sufficiently large to grow can have been carried by any natural means.

In my previous note on *P. decipiens** I gave my reasons for considering that plant a hybrid, reasons I need not here repeat; but will mention one fact which suggests that *P. decipiens* in some forms may possess pollen which is partly, though imperfectly, fertile. Mr. H. Bromwich tells me that the form which he sent to the Exchange Club as "*P. decipiens*, v. *affine*," seems to be as fertile as any other *Potamogeton*. It certainly does seem so up to a certain point. The fruit-spike swells its drupelets till about one half grown, then they shrivel and remain dead on the spike (in our Fen-land *decipiens* the drupelets usually rot quite away).

This looks like a first effort in the direction of fertile pollen. I do not think the stimulus that causes the swelling of the drupelets to be foreign pollen from other species of *Potamogeton*, because the spikes seem to swell regularly, not a single drupelet here and there. Mr. Bromwich informs me the plant grows apart from other forms.

That certain plants of *Potamogeton* which are not hybrids may remain barren for many years, even under apparently favourable conditions, is a fact I have already ascertained. And I think it is fairly well known that such supposed hybrids as *P. lanceolatus* of Smith, and *P. varians* of Morong, do rarely become fertile under favourable conditions. Hence I am not unhopeful that many of our hybrid Potamogetons may ultimately progress to more or less perfect fertility. To keep this note within reasonable limits I can mention only one other instance of supposed hybridity between distinct species of *Potamogeton*. In the summer of 1889, my nephew, Mr. C. R. Billups, sent me a remarkable form from the River Dee, above Chester, under the name of "*P. crispus*." I at once referred this plant to *P. perfoliatus*, a decision which received support from other botanists; but Mr. Billups, a very acute naturalist, was unable to concur, and pointed out that the stem was compressed like that of *P. crispus*, and that in habit the plant resembled that species rather than *perfoliatus*. I planted several roots, and as the plant grew it produced young shoots from the axils of the leaves on the main stem, so like those of *P. crispus* as to require careful examination to enable one to separate them from that species with certainty. At the present time the lower leaves on the young stems resemble those of a narrow-leaved form of *perfoliatus*, while those on the upper part of the stem are nearly like those of *crispus*. Mr. Billups informs me that he found only one patch of the plant, a very large and dense one, of remarkably vigorous growth, but producing no flower-spikes.

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* My friend Mr. Beeby, who has often been helpful to me in my studies in this genus, sends me the following correction on that note. "I do not find 'empty' anthers on your Fen-plant. As in *nitens*, they are simply unopened; and, as in that plant, they contain plenty of pollen—of a sort."—W. H. B. *in litt.*, *May* 10*th*, 1890.

Having carefully compared for some months the living plant from the Dee with fresh examples of *P. perfoliatus* growing in the Fens, I find it differs from that plant in not dying down in winter; but remains growing from late autumn to spring just as *crispus* does; which plant it also resembles in habit, and in the lower leaves of the young stems being *like ordinary leaves*, but *mounted on the backs of the lower stipules*. Surely we may regard this Dee plant as a hybrid between *P. crispus* and *P. perfoliatus?*

Dr. Tiselius sent me early in the present year an extensive series of *P. nitens*. Amongst them was a remarkable form which he labels

> " *P. nitens* Wil.
> f. *intermedia* mihi.
> Antea *P. intermedius* mihi (ad interim) distributa."

I was much struck with the resemblance between this *P. intermedius* and a series of plants collected in " Birsay Loch, Orkney " (Co. 111) by the late Dr. Boswell; and also, in a less degree, by its resemblance to a Surrey form from the Woking Canal, collected by Mr. Beeby.

All these *intermedius*-like forms grow together with *P. nitens* and *P. heterophyllis*, and suggest that they are the offspring of the two segregates. This supposition presents some difficulties. One of the supposed parents, *P. nitens*, seems not to be known with *fertile spikes of seed* (possibly *single drupelets* may be produced in some instances, but the proofs of this are doubtful to me), its pollen also seems to be abortive. The supposed intermediates are produced in such abundance that I think if *P. nitens* were the seed-bearing parent, some examples of fruiting spikes of *nitens* would exist in herbariums; but I have met with none, nor can anyone tell me where one is to be seen. All plants I have had sent to me as fruiting *nitens* are good *heterophyllus.*

On looking over collections of Potamogetons from localities where *P. heterophyllus* grows with *P. nitens*, I have been frequently surprised at the resemblance some specimens of the former plant bear to the latter, so that again the idea of hybridity between the two forms has been suggested. Some of the forms from these localities are *nitens*-like, and yet not resembling the *P. intermedius* of Tiselius. And the question naturally arises: whence the resemblance?

I have no facts to offer in solution of this difficult question, and no hypothesis which does not break down almost at the outset. I do not think, as has been suggested to me, that *nitens* is the seed-bearing parent, but rather that the pollen of *nitens* is occasionally fertile. In which case a single potent spike would fertilize very many drupelets of any *Potamogeton* it could cross with.

The facts I have attempted to show are these :—1. That nearly allied forms, such as *P. Zizii* and *P. heterophyllus*, certainly cross. 2. That these cross-bred plants are sometimes fertile. 3. That their offspring varies from seed just as artificially-produced hybrids do. 4. That if we consider these hybrids as mongrels, *i.e.*, as the offspring of *varieties* instead of *species*, yet no such doubt can attach to *P. fluitans*, the result of *lucens* × *natans*, which hybrid, though usually barren, may also occasionally be fertile; and 5, That Potamogetons may progress from absolute sterility, to more or less complete fertility, under the influence of extended time and favourable conditions.

If my contention is correct, I think we may then safely assume that crossing of "species" has been, and still is, one of the methods by which other species are fashioned.

NOTES ON HIGHLAND PLANTS.

By Rev. E. S. Marshall, M.A., F.L.S., and F. J. Hanbury, F.L.S.

We spent a fortnight together during the second half of last July; the places visited being Kingshouse and Inveroran, in the "Black Mount" district of Argyle (vice-county 98), and Tyndrum and Crianlarich, Mid-Perth (v.c. 88). Special attention was paid to *Hieracia*, a number of which were collected, several being forms not yet identified. A few references are made to plants found by one or both of us in previous years. After we had parted company, some things of interest were gathered by E. S. M. in Corrie Ardran, Glen Dochart, and on Meall-na-Saone, Glen Lochay, which was ascended from Luib; and a short excursion to Ben-a-chroin, at the head of Glen Falloch, also yielded new stations for some Perthshire plants. We place this in v.c. 87 (W. Perth), in accordance with Watson's map. We have to acknowledge help from Professors Babington and Hackel, as well as from Messrs. Beeby, Bennett, Cosmo Melvill, Townsend, the Rev. E. F. Linton, and Dr. Buchanan White.

We believe plants marked * to be unrecorded for the vice-county.

Ranunculus hederaceus L. Kingshouse, at 800 feet.—*R. flammula* L., var. *radicans* Nolte, is abundant and well-marked on the gravelly shores of Loch Tulla, Inveroran. Var. *petiolaris* Lange, was again collected near Kingshouse, this time in good fruit. The carpels are rather larger than those of var. *radicans*, but do not materially differ. We are, however, by no means convinced that the plant is not a distinct species. The peculiar *Littorella*-like root-leaves (retained under cultivation) are totally different from those of typical *Flammula*, and are very evanescent, mostly disappearing before the fruit ripens. The whole plant is remarkably brittle and upright, and, among the many specimens which we examined, we did not find a single intermediate or connecting link with the assumed type. A weak stem, which became decumbent and lived through last winter, developed three nodal-rooting plants, the leaves of which had the look of *Littorella*, already mentioned; but they have since died. It has not flowered in cultivation hitherto, and a specimen sent to Mr. Bennett soon died. This form is probably frequent on the gravelly lake-margins of Rannoch Muir, and deserves further study.—**R. Steveni* Andrz. A beautiful buttercup, which is placed here by Messrs. Beeby, Bennett, and Townsend, was gathered sparingly, in flower only, at about 2700 feet, on granite, near Kingshouse (98). It has a horizontal root-stock, and the leaves are firm in texture, with broad lobes. The same form was gathered by F. J. H. on Cairn Toul, Aberdeenshire, at 3500 feet, in 1887.

Nuphar pumilum Sm. Very abundant in a lakelet adjoining Lochan Dhu, near Kingshouse.

**Nymphæa alba* L., var. *minor*. Syme. Same locality (98).

Arabis petræa Lam. The Ben Laoigh form seems to us fully deserving of Mr. Druce's varietal name; its sub-entire leaves and large and sometimes purplish flowers at once distinguish it. At first sight, one would hardly take it for the same species as that of the Braemar district.

Draba rupestris R. Br. Am Binnein, Ben More (88).

Cochlearia officinalis L., var. *alpina* (Watson) Bab. Clach Leathad, Kingshouse, at 3000 feet; Meall Buidhe, near Inveroran, at 2500 feet; Am Binnein, up to about 3500 feet.—*C. grœnlandica* L. Am Binnein, from 3300 to 3500 feet. Clearly identical with the Ben Lawers plant passed as this species by Prof. Babington.

Subularia aquatica L. Loch Tulla (98); Loch Dochart (88).

Polygala serpyllacea Weihe. Glen Falloch.

Cerastium arcticum Lange. Am Binnein, associated, as on Ben Lawers, with both forms of *C. alpinum* L. The var. *piloso-pubescens* Benth. (*pubescens* Syme) of the latter was also met with in Innis Choarach, Meall-na-Soane.

Sagina procumbens L., ascends to quite 3300 feet on Am Binnein.—*S. Linnæi* Presl. Meall Buidhe (98); Ben Laoigh and Innis Choarach (88).—*S. nivalis* Fr. Our visit to Am Binnein was mainly in order to search for this plant, once found there many years ago. A single fine and typical specimen was obtained at about 3500 feet.

Anthyllis Vulneraria L. Railway-banks near Crianlarich; apparently var. *Dillenii* (Schultz).

Rubus villicaulis* Koehl. (teste Baker). Streamside, Inveroran (98).—R. Chamæmorus* L. Near Kingshouse, at 2300 feet (98).

Rosa tomentosa Sm., var. *subglobosa* (Sm.) Crianlarich.

Saxifraga nivalis L. Am Binnein.—**S. quinquefida* Haw. (*S. sponhemica* Gmel.) Ben-a-chroin (87).

**Callitriche stagnalis* Scop., var. *serpyllifolia* Lönnroth, "Obs. Crit. Pl. Suec. Illustr." p. 16 (1854) (teste Ar. Bennett). Kingshouse (98), on mud. What is probably the same form was seen, but not taken, by the shore of Loch Dochart. Mr. Bennett has it from W. Sutherland.

**Epilobium angustifolium* L. Mountain-glen near Kingshouse (98), at 2000 feet.

Solidago Virgaurea L., var. **cambrica* (Huds.) On granite, near Kingshouse (98), above 2500 feet.

Cnicus heterophyllus Willd. The laciniate-leaved form occurs on the river-bank opposite Luib Station.

Hieracium holosericeum Backh. In two or three places near Kingshouse, from 2000 to 2700 feet; mostly small and without flowers.—**H. eximium* Backh. (type). Plentiful on granite near Kingshouse; more sparingly on mica-schist, Meall Buidhe (98).—Var. *tenellum* Backh., near Kingshouse; much scarcer than the type.—**H. calenduliflorum* Backh. Mountains near Kingshouse; plentiful in one glen. Foliage luxuriant and typical. Flowers rather smaller than in the Braemar form; frequently two and occasionally three or even four heads on one stem (98).—*H. gracilentum* Backh. On granite, about Kingshouse; Meall Buidhe, on mica-schist.—**H. nigrescens* Willd. Cliffs of Meall Buidhe (98). Forms probably referable to this species, but unlike that of the Cairngorms, occur about Kingshouse.—*H. lingulatum* Backh. Frequent around Kingshouse; the yellow-styled plant recorded last year being much rarer than the typical one with livid styles. Ben Laoigh; Corrie Ardran (88). Ben-a-chroin (*87).—*H. senescens* Backh. Meall Buidhe (*98). Ben Laoigh; Am Binnein; Corrie Ardran; Innis Choarach (88). Ben-a-chroin (*87). Evidently a characteristic plant of the Western Breadalbanes.—*H. anglicum* Fr. About Kingshouse; Meall Buidhe (*98). Ben More; Ben Laoigh, &c. (88). Glen Falloch (*97).—Var. *longibracteatum* F. J. Hanbury. Stream-side, near Kingshouse (*98).—**H. iricum* Fr. About Kingshouse (98).—*H. argenteum* Fr., Inveroran; scarce.—*H. murorum* L. (segregate). Near Kingshouse (*98), in various forms. Glen Falloch (*87).—*H. Dewari* Bosw. About Kingshouse (98). Crianlarich (88); scarce. Glen Falloch (87), at about 1300 feet.—*H. prenanthoides* Vill. Crianlarich; scarce.—**H. umbellatum* L. In open meadows at Inveroran (89). Rare in the Highlands.—*H. corymbosum* Fr. Railway-banks between Crianlarich and Luib (88).—*H. auratum* Fr. Kingshouse and Inveroran (98); Tyndrum and Crianlarich (88).—*H. sparsifolium* Lindeberg. Inveroran (98).

Campanula rotundifolia L., var. *lancifolia* Mert. and Koch (Mr. Bennett points out that their 'Deutsch. Fl.' is referred to in Koch's 'Synopsis'). Cliffs of Ben-a-chroin, at 2500 feet.—*C. rotundifolia* was gathered on the very summit of Am Binnein, at an altitude of 3820 feet, over 300 feet higher than previously recorded in Britain.

**Vaccinium uliginosum* L. Ben-a-chroin (87).

Euphrasia officinalis L. A tiny plant, ½ to 1½ inch high, which grows on Am Binnein between 3500 and 3700 feet, and at a similar altitude on Ben Lawers, is referred by Mr. Townsend to a dwarf form of his var. *borealis* of *E. Rostkoviana* Heyne. Another, about 2 inches high, occurred at 2000 feet on Ben Laoigh, and this he places under *E. gracilis* Fr.

**Veronica serpyllifolia* L., b. *humifusa* (Dicks.). Ben-a-chroin (87).

Betula intermedia Thomas, found by us in Glen Callater, in

1886, and assented to by Prof. Babington, is now confirmed by Mr. Ar. Bennett, who had doubted the naming, after comparison with authentic examples at Kew. Regel regards this as *B. pubescens* × *nana*.—**B. pubescens* Ehrh. (*glutinosa* Fr.), var. *parvifolia* (Wimm.) By the Falloch burn (87), at about 1500 feet. (The name *B. odorata* Bechst., is applied by some German botanists to *B. pubescens* × *verrucosa*; Ehrhart's appears to be the oldest name, and is adopted by Regel, in his 'Bemerkungen.') Another form grew with this, and seemed to be near var. *carpatica*. Prof. Babington writes of this :—"It is very like *hercynica* as figured by Reichenbach 'Icones' XII., 624, a form of *carpatica*."

**Salix nigricans* Sm. and **S. lapponum* L. Ben-a-chroin (87).—*S. Arbuscula* × *lapponum*. Innis Choarach, Glen Lochay, in two forms. Attested by Dr. White, who has found this and other hybrids in the vicinity, a specially rich one for willows.

Pinus sylvestris L. Certainly native, around Inveroran.

**Juniperus nana* Willd. In good fruit, at 2000 feet, near Kingshouse (98).

Malaxis paludosa Sw. Ascending to Corrie Ardran from Crianlarich, at about 1400 feet.

Habenaria albida R. Br. Near Inveroran; without personal authority for 98 in 'Top. Bot.'—*H. chloroleuca* Ridley. Inveroran.

Tofieldia palustris Huds. Near Kingshouse; no personal authority for 98.

Juncus alpinus Vill. Meall-na-Saone, above 2500 feet.—*J. castaneus*. Innis Choarach (88), scarce; Ben-a-chroin (*87).—*J. biglumis* L. Innis Choarach, sparingly.

Sparganium affine Schnizl. (teste Beeby). Kingshouse and Inveroran (*98). Also seen, but not collected, in Loch Dochart.

Potamogeton natans L. A small state, in one of the lakelets near Kingshouse.

Kobresia caricina Willd., was found sparingly in Innis Choarach, as well as (in profusion) on Ben Laoigh.

Carex curta Good. Inveroran (98). Queried in 'Top. Bot.'—*C. atrata* L. Meall Buidhe (98).—*C. aquatilis* Wahl., var. *elatior* Bab. Marshy ground, near the head of Loch Dochart.—*C. magellanica* Lam. (*C. irrigua* Hoppe). Ascending to Corrie Ardran, at about 1400 feet.—*C. limosa* L. A form (or variety) occurs in a very wet sphagnous bog, a little to the north of Lochan Etive, Kingshouse. Its inflorescence is laxer than usual; the glumes being much paler (yellowish-rufous), with an awned mid-rib. Mr. Bennett writes :—"Here there is an approach to some of the characters of *C. stygia* Fr., but the lower bracts are not of that, and the male spikelet is too slender; and this is almost like what Dr. White has gathered and called '*C. limosa*, intermediate between that and *irrigua*.' I think you may call it *limosa*, f." The only point of resemblance to *irrigua* is in the awned glumes. It was much affected with "smut."—*C. flava* × *fulva*. Near Loch Tulla, Inveroran (98).—*C. flava* × *pulla* occurs with the parents at about 2800 feet on Ben More, in some quantity; and was also found growing with them on Ben Laoigh, whence Mr. Druce originally recorded it. The fruit is remarkably inflated; in general habit there is a closer approach to _flava_ than to _pulla_.—_C. chrysites_ Link. (_C. Oederi_ auct., non. Ehrh.). Near Loch Tulla, Inveroran (*98); also by the shore of Loch Dochart.

Agrostis alba L., var. *_coarctata_ (Hoffm.) (teste Hackel). Shore of Loch Dochart. F. J. H. has also gathered this beside Loch Watten, Caithness. The following description is given by Hoffmann in his 'Deutschlands Flora,' i. 37 :—"_A. coarctata_, panic. contracta, calyc. subæqualibus, corollis brevioribus obtusis hispidulis, fol. angustis. Ehrh. _gram._ 133 . . . (Panic. 2–3-uncialis contracta s. erecta e violaceo purpurascens, calyc. valv. subæquales, exterior dorso hispidula. Fol. angusta fere setacea. Culmus filiformis basi obliquus. Radix stolonifera. . .)."

A. vulgaris With., var _pumila_ (L.). Stony roadsides near Kingshouse, at about 1000 feet.

Deschampsia cæspitosa Beauv., var. _pallida_ Koch. Near Kingshouse, at about 2000 feet; evidently a mere "sport" from the type, with which it grew.

Holcus mollis L. ascends to quite 1800 feet at Kingshouse, about one hundred yards higher than hitherto observed in Britain.

Avena pratensis L., var. _longifolia_ (Parn.) (teste Hackel). Ben Laoigh, above 2000 feet.

Phragmites communis Trin., var. _nigricans_ Gren. and Godr. Near Inveroran.

Poa annua L., var. _supina_ (Schrad.) (teste Hackel). Alpine rills, Ben Laoigh.—_P. glauca_ Sm. Am Binnein and Corrie Ardran (88); Ben-a-chroin (*87). All passed as correct by Prof. Hackel.—_P. Balfourii_ Bab., var. _montana_ Bab. Ben Laoigh, above 2000 feet, in good quantity. Queried as above by Prof. Hackel, and confirmed by Prof. Babington.

Festuca rubra L., subvar. _grandiflora_ Hackel, forma _alpina_ (ipso teste). Meall Buidhe (98); Am Binnein (88). A state which appears to be var. _subcæspitosa_ Sonder, was gathered by E. S. M. on the Little Culrannoch, Forfarshire, in 1888, and keeps its distinct habit under cultivation.

Cryptogramme crispa R. Br. Clach Leathad, near Kingshouse; also high up in the great Perthshire corrie of Ben Laoigh. Quite a scarce Highland species.

Athyrium alpestre Milde. Mountains near Kingshouse (no personal authority for 98). Ben Laoigh. Ben-a-chroin.

*_Equisetum pratense_ Ehrh. Cliffs of Meall Buidhe, at 2500 feet (98).

*_Lycopodium annotinum_ L. On granite, near Kingshouse, at 2500 feet.

Pilularia globulifera L. Margin of Loch Tulla (98), in profusion.

Nitella opaca Agardh is abundant in Loch Dochart.

Obs. A _Plantago_, which occurs in wet places on the limestone, Ben Laoigh, above 2000 feet, requires further investigation, and may, probably, be distinct from _P. maritima_ L. It has narrowly linear leaves, $\frac{3}{4}$—$1\frac{3}{4}$ inches long in our specimens; heads small and short ($\frac{1}{4}$—$\frac{1}{3}$ inch), broadly ovate to oblong-lanceolate. In habit it is not unlike a small plant which we have gathered on limestone in Upper Teesdale. We collected it too early and in too small quantity for satisfactory determination.

We have received some determinations of *Hieracia* from Dr. Lindeberg since writing this paper, several being forms new to this country; we shall hope to record them before long.

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.

By James Britten, F.L.S., and G. S. Boulger, F.L.S.

(Continued from p. 156.)

Rainey, George (fl. 1842–73). Lecturer on Micros. Anatomy, St. Thomas' Hospital. 'Sap,' 1847. 'Starch-granules,' Quart. Journ. Micros. Sci. viii. 1860, 1. Pritz. 256; Jacks. 80; R. S. C. v. 79; viii. 689.

Ram, William (fl. 1606).) ? Public Notary of Colchester, Ger. Herb. 278. 'Little Dodeon,' 1606 (epitome of Dodoens' Herbal).

Ramsay, James (1812–1888): b. Kilwinning, Ayrshire, 1812; d. Glasgow, 10th Sept., 1888. Lect. Bot. Glasgow Mechanics' Inst., 1867–8. Papers on Scottish Plants in Proc. N. H. S. Glasgow, 1859–1875. Proc. Nat. Hist. Glasgow, iii. (n. s.) vii.

Rand, Isaac (d. 1743): d. London, 1743. Apothecary in the Haymarket. F.R.S. Præfectus Horti Chelsiani, 1722 (?)–1739 or 1743. 'Index pl. officin. hort. Chels.,' 1730. 'Hort. Chels. index compendiarius,' 1739. Helped Elizabeth Blackwell in 'Curious Herbal.' Lists of Chelsea plants in Birch MSS. Pl. in Herb. Mus. Brit. Jacks. 410; Journ. Bot. 1863, 32; Rich. Corr. 125; Semple, 41–63. Fl. Midd. 388. *Randia* L.

Rashleigh, William (fl. 1809). Of Cornwall. Algologist. Correspondent of Dawson Turner. Turn. Fuci, ii. 43.

Rauthmell, Rev. Richard (fl. 1727–1746): b. Little Bowland, West Yorkshire; bur. Chipping, Lancashire. B.A. Camb., 1713. Curate of Whitewell, Bowland. Formed a herbarium. Rich. Corr. 314, 355.

Ravenshaw, Rev. Thomas Fitzarthur Torin (1829?–1882): b. London, 1829?; d. London, 26th Sept. 1882. M.A. Oxon, 1854. Rector of Pewsey, Wilts, 1857. Contrib. to 'Phytol.,' 1857–9. 'Flowering Plants of Devon,' 1860; ed. 2, 1872. 'Botany of N. Devon' in Stewart's N. Devon Handbook, 1874. Jacks. 250; R. S. C. v. 110; Journ. Bot. 1882, 352.

Ray, Rev. John (1627–1705): b. Black Notley, Essex, 29th Nov. 1627; d. same place, 17th Jan. 1705; bur. Black Notley Churchyard. M.A., Camb., 1651. F.R.S., 1667. 'Catalogus pl. circ. Cantab.,' 1660. 'Cat. pl. Angliæ,' 1670; ed. 2, 1677. 'Methodus,' 1682. 'Historia Plantarum,' 1686–1704. 'Synopsis,' 1690; ed. 2, 1696. European herbarium and letters in Mus. Brit.

Pult. i. 189; Rees; Pritz. 257; Jacks. 596; 'Memorials' by Lankester, 1846; 'Correspondence,' 1848; Gibson, Fl. Essex, 444; Cott. Gard. v. 221; Journ. Hort. xxi. (1876), 512, with portr. Portr. and bust, Trin. Coll. Camb.; portr. Nat. Portr. Gallery, Kew, &c. Wedgwood medallion. *Rajania* L.

Rayer, Jacob (d. circ. 1796). Apothecary? of Bolt Court, Fleet Street. Friend of Smith. Botanized in home counties. Contributed to Eng. Bot. 1790–6 (tt. 65, 71, &c.).

Rea, John (d. 1681): d. Kinlet, near Bewdley, Nov. 1681. Nurseryman. 'Flora, Ceres and Pomona,' 1665; ed. 2, 1696. Introduced *Corylus Colurna*, 1665. Pritz. 257; Journ. Hort. 1876, 172.

Reade, Rev. Joseph Bancroft (1801–1870): b. Leeds, 1st April, 1801; d. 1870. M.A., Camb., 1828. F.R.S. Microscopist. One of founders and President, Microscopical Soc. 'Spiral vessels in roots,' Mag. Zool. Bot. i. (1838), 111. Monthly Microscopical Journal, v. 92. R. S. C. v. 114; viii. 710.

Reeks, Henry (1838–1882): b. Standen, Berks, 15th March, 1838; d. Thruxton, Hants, 20th Feb. 1882. F.L.S., 1866. 'Newfoundland Plants,' Journ. Bot. 1871, 16. 'Plants of East Woodhay,' Rep. Newbury Field Club, 1870–1. Jacks. 364; R. S. C. viii. 714; Journ. Bot. 1882, 352; Proc. Linn. Soc. 1880–2, 65.

Reeves, John (1774–1856): b. West Ham, 1st May, 1774; d. Clapham, 22nd March, 1856. F.L.S., 1817. F.R.S., 1817. Father of the following. Went to China as inspector of tea to H.E.I.C., 1812–1831. Lived at Macao, afterwards at Clapham. Correspondent of Banks. Sent home *Wistaria*. Made collection of drawings of Chinese plants, now in Bot. Dept., Brit. Mus. Gard. Chron. 1856, 212; Proc. Linn. Soc. 1856, xliii.; Cott. Gard. xvi. 21; R. S. C. v. 127. *Reevesia* Lindl.

Reeves, John Russell (1804–1877): b. 1804; d. Wimbledon, Surrey, 1st May, 1877. F.R.S. F.L.S., 1832. Lived thirty years in Canton. Had a herbarium. Journ. Bot. 1877, 192; Gard. Chron. 1877, i. 604.

Reeves, Rev. John William (fl. 1843). M.A., Camb., 1843. Herbarium, including that of Dean Garnier, in Winchester Public Library. Fl. Hampshire, xx., xxii.

Reid, Eliza P. (fl. 1826). Of Windsor. 'Historical and Literary Botany,' 1826. Jacks. 214.

Reid, Francis A. (fl. 1852). Lieut. Sec. Madras Horticult. Soc. and Director of its garden. *Reidia* Wight.

Reid, Hugo (fl. 1832–1870). Of Edinburgh. Lect. Nat. Philosophy, Liverpool High School. 'Botanical Classification,' 1838. 'Science of Botany,' 1837. Pritz. 260; Jacks. 597; Allibone.

Reid, James (fl. 1692). Sent plants from Barbadoes to Petiver and Courten. 'Plants from Barbados by James Reid the quaker. Sent thither on King William's account, 1692.' Herb. Sloane, 55. Mus. Pet. no. 31 (*Rheed*). Plukenet, Alm. 15. (*Reede*).

Relhan, Rev. Richard (1753–1823): b. 1753; d. 1823. M.A., Camb., 1779. F.L.S., 1788. F.R.S. 'Flora Cantabrigiensis, 1785–1793, ed. 2, 1802; ed. 3, 1820. 'Heads of Lectures on Botany,' 1787. Contrib. to E. Bot. Babington, Fl. Cambridge, x. Bot. Guide, 41, 335 (138, 288, 333); Pritz. 260; Jacks. 597; Rose; Allibone. *Relhania*, L'Hérit.

Rennie, Rev. James (d. 1867): d. Australia, 1867. M.A. Prof. Zool. King's Coll., London. In Australia fr. 1840. 'Magazine of Botany,' 1833–4. 'Alphabet of Botany,' 1833. 'Handbook of Bot.' 1834. 'Familiar Introduction to Botany,' 1849. Jacks. 597; Allibone.

Reynardson, Samuel (d. 1721); d. Hillingdon, Middlesex, 1721. Of Cedar House, Hillingdon, fr. 1678. Had green-houses, a fine collection, museum and library and "great correspondence abroad." Collection sold to Robert Walpole. Plukenet, 'Amaltheum,' 63. 'Mantissa,' 51, 147. 'Cat. by Society of Gardiners', 1730. Loudon, 'Arboretum, 56, 59, 61.

Rhind, William (fl. 1833–1867). M.R.C.S. Lect. Bot. Marischal Coll., Aberdeen. 'History of Veg. Kingdom,' 1840–1. 'Catechism of Bot.' 1833. Pritz. 262; Jacks. 597. no bot.

Rhydderch, Sion, *alias* **Roderick, John** (fl. 1737). Printer. Of Shrewsbury. 'Y geir Cyfr Saesneg a Chymraeg,' 'An English-Welsh Herbal,' 1737. Davies, 'Welsh Botanology,' p. vii.

Richards, Thomas (fl. 1753–1816). Of Coychurch. 'Welsh and English Botanology,' in 'Antiquæ Linguæ Britannicæ Thesaurus,' 1815. Davies' 'Welsh Botanology,' p. vii.

Richardson, David Lester (1800–1865): b. 1800; d. 1865. Major in Bengal army. In India 1819–1827, 1829–1861. Professor at Calcutta. Editor from 1861 of Allen's 'Indian Mail.' 'Flowers and flower-gardens,' 1855. Pritz. 263, Jacks. 215. Memoir by J. W. Kaye, in 'Calcutta Review,' vol. xvi; Allibone.

Richardson, Sir John (1787–1865): b. Dumfries, 5th Nov., 1787; d. Grasmere, Westmoreland, 5th June, 1865. F.R.S. F.L.S. M.D., Edin., 1816. Surgeon and Naturalist in Franklin's 1st (1819) and 2nd (1825–8) Expeditions; 3rd Arctic Expedition, 1851; made large collections. Knighted, 1846. Plants at British Museum and Kew. Bot. Misc. i. 70. Proc. Linn. Soc. 1865–6, lxxxiv. Pritz. 263; Jacks. 223; R. S. C., v. 188, viii. 744. 'Life,' by Rev. John McIlraith, 1868. 'Reader,' 1865, i. 707. Allibone. *Heuchera Richardsonii* Br.

Richardson, Richard (1663–1741): b. North Bierly, near Bradford, Yorks., 6th Sept., 1663; d. same place, 21st April, 1741; bur. New Chapel Church, nr. Cleck Heaton. M.B., Oxon. M.D., Leyden, 1699. F.R.S., 1712. Found *Trichomanes radicans*, in Yorks. Phil. Trans. no. 128, p. 526. 'De cultu hortorum,' 1699.' Contrib. to Ray's 'Synopsis,' ed. 3. MS. 'Deliciæ Hortenses,' 1696, and 'Index Hort. Bierleiensis,' 1737. Pult. ii. 185; Pritz. 263; Jacks. 4; Petiver, Mus. 95; Loud. Gard. Mag. iii. 127; Salisb. Gen. 114. 'Correspondence,' 1835, w. portr. Nich. Illust. i. 225, w. portr. viii. 1858; ix.

804. Bust on tomb. Plants in Herb. Sloane, 61, 72, 79, 114, 145, 146. *Richardia* L.; *Richardsonia* Kunth.

Richardson, Rev. William (1740–1820): b. Ireland, 1740; d. Clonfele, Co. Antrim, 1820. D.D. Agriculturist. Of Moy and Clonfele, 'Useful Grasses,' Trans. Irish Acad, xi. 88 (1810). 'Fiorin Grass,' Phil. Mag. 1816, 136. R. S. C. v. 190; Donaldson's Agric. Biogr. 108.

Richardson, Rev. William (d. 1768): b. Ullswater, Cumberland. Rector of Dacre, Cumberland, 1742. Prepared the flora for Hutchinson's 'Hist. of Cumberland.' Baker, Fl. Lake District, 9; Bot. Guide, 143.

Richardson, William (1797–1879): b. Hebburn, Northumberland, 31st Aug., 1797; d. Alnwick, 18th April, 1879. Saddler. Of Alnwick. Member of Bot. Exchange Club. Discovered *Psamma baltica.* Journ. Bot. 1872 21; Proc. Berwicksh. Field Club, ix. 184; R. S. C. v. 67 ("W. R., jun.") viii. 744.

Riley, J. (d. 1846): d. York, 1846. Of Papplewick, near Nottingham. F.B.S.E. Local Sec. Bot. Soc. Lond. 1843. 'Hybridity in ferns,' Proc. Bot. Soc. Lond. 60. 'Catalogue of Ferns, after Sprengel,' 1841. Had a fern herbarium. Phyt. ii. 779; Pritz. 264.

Ritchie, Joseph (d. 1821): d. Mourzouk, 26th November, 1821. African Traveller. Collected near Tripoli, &c., and made notes on the plants. Appendix to 'Denham and Clapperton's Travels,' 209; Huish, 'Travels of R. and J. Lander.' *Ritchiea* Br.

Ritson, A. (fl. 1832). 'Spring Flowers,' 1832. Jacks. 38.

Roberts, John (d. before 1843). A.L.S. Miller. Of Norwich, late of Salisbury. Helped Maton with botany of Salisbury. Maton, 'Nat. Hist. Wilts,' 10.

Roberts, Miss Mary (1789–1864): b. Painswick?, Gloucestershire, 1789; d. Brompton, 13th Jan., 1864; bur. Brompton Cemetery. 'Wonders of Veg. Kingdom,' 1822. 'Annals of my Village,' 1831. 'Plants and Animals of America,' 1839. 'Voices from the Woodlands,' 1850. Jacks. 245; Friends' Books, ii. 500; Allibone.

Robertson, Archibald (fl. 1822). M.D. Of Edinburgh. 'Colloquia de rebus præcipuis physiologiæ Vegetabilium atque botanices,' 1822. Pritz. 265.

Robertson, Benjamin (d. 1800). Of Stockwell. Had a bot. garden at Stockwell. Friend of A. H. Haworth. Haworth, 'Miscellanies,' 190. *Robertsonia* Haw. = *Saxifraga.*

Robertson, John (d. 1865): b. Perthshire; d. Glasgow, 24th March, 1865. A. B. S. Ed. 1863. Gardener at Kew and at Kinfauns Castle. Prepared 'Flora of Perthshire' (unpublished). Trans. Bot. Soc. ed. viii. 337; R. S. C. v. 230.

Robertson, William (fl. 1814). Of Newcastle. Friend of Alder and Hancock. "A very accurate investigator of lichens." E. Bot. 2602.

Robinson, Anthony (d. before 1814). Surgeon. Of Sunderland. Went to Jamaica. MSS. much used by Lunan in 'Hortus Jamaicensis' (see 'Notice to subscribers' and i. 273).

Robinson, James Frodsham (1838–1884): b. nr. Netherton, Frodsham, 16th July, 1838; d. Frodsham, 4th Nov., 1884. Druggist. Went to Montpellier to collect for Mr. George Maw, circ. 1868, and then to Norway. Curator, Museum of Owen's College, Manchester, circ. 1879–1882. Sent lists of Carnarvon, Flint, and Anglesea plants to Top. Bot., none of which are to be accepted as accurate. Top. Bot. 554, ed. 1., 618, ed. 2; R. S. C. v. 238, viii. 764.

Robinson, Sir Tancred (d. 1748): d. 29th March, 1748. M.B., Camb. 1679. M.D., 1685. F.R.S., 1684. F.R.C.P., 1687. Friend of Ray. Physician in ordinary to George I. Knighted, 1714 ?. Studied, w. Sloane, under Tournefort. 'Tubera terræ,' Pult. ii. 118; Phil. Trans. 1693. "Vir de re herbariâ optime meritus." Plukenet, 'Almagestum'; Ray, Mem. 10; Munk, i. 469.

Robinson, Rev. Thomas (d. 1719): Rector of Ousby, Cumberland, 1672–1719. Correspondent of Ray. 'Natural History of Westmoreland and Cumberland,' 1709. Pult. i. 354.

Robinson, Mrs. (d. 1847). Of Fareham, Hants. Friend of Rev. G. E. Smith. Discovered *Statice bahusiensis*, 1840. Herb. bequeathed to Brit. Mus.

Robley, Augusta J. (fl. 1845): Drew plates for 'Madeira Flowers.' 1845. Pritz. 265; Jacks. 353.

(To be continued.)

SHORT NOTES.

Lepidium Draba L., in Wales.—This plant has not yet, so far as I can trace, been recorded from Wales or any portion of the west coast. It has, however, been known by Miss E. Foulkes-Jones, resident at Aberayron in Cardiganshire, to have been established for several years at least, on various banks forming field divisions, between that town and the sea. I received specimens from her in 1888, and again during the present month (May). In the Record Club 'Report' for 1884–6 the editor remarked that the species had become widely spread, but that the recognition accorded to it in Prof. Babington's 'Manual' fell far short of the facts. The statement in the 'Manual' (ed. viii.) is simply,—"established in many places, but not naturalised." In Hooker's 'Student's Manual' (ed. iii.), the plant is described as "rare and sporadic: (an alien, *Watson*)." The R. C. reports have made known instances of its occurrence in many counties. In Kent I have myself traced it along the coast from White Haven to Ramsgate, and inland to Minster,—usually in plenty. At Margate it occurs in tens of thousands, and along the cliff-edge and in all waste places it, in June, forms the most marked feature of the vegetation. It springs up in quantities as a weed in the gardens. In 1888, at any rate, its seed ripened there abundantly.—W. Whitwell.

Lepidium ruderale L., in Carnarvonshire.—In 'Top. Bot.,' ed. ii., this is marked for county 49 "(J. E. Griffith)," indicating nonindigenity. What locality that record refers to I do not know. Miss Foulkes-Jones has sent me a plant gathered by herself in 1874, on a wall at Gloddaeth, near Llandudno,—seemingly not a likely place for the species to occur as an introduction.—W. Whitwell.

Chara fragilis Desv., in Denbighshire.—I gathered this species in 1875, from a small pond below a structure then known as "Whalley's Folly," on a moorland height between Trevor and Llangollen. On the appearance of the article by Messrs. Groves in the 'Journal of Botany' for last March, with its remark that Denbighshire had no *Chara* record hitherto, I forwarded the specimens to those gentlemen, and they kindly informed me that the form was one approaching to *barbata*.—W. Whitwell.

NOTICES OF BOOKS.

The Flowering Plant: as Illustrating the First Principles of Botany. By I. R. Ainsworth Davis, B.A. London: Griffin. 8vo, pp. x. 181; 61 cuts.

Mr. Davis has already proved in his 'Introduction to Biology' that he is a very capable biologist, as fully abreast of modern discovery, both in Zoology and Botany, as it is possible for one ordinary man to be in so wide a field of science, and that he is gifted with the power of imparting his knowledge in a clear and concise manner. In judging the value of the present much more elementary work, we have chiefly to consider how far he has succeeded in suiting his book to the precise needs of the class of students for which he intends it. Strangely enough, there is some difficulty in ascertaining who are those for whom the volume is designed. It deals with "first principles," and it is stated in the preface that "no previous knowledge [of Botany, I suppose is meant], is assumed" on the part of the reader. Candidly I do not think that Mr. Davis's volume is well adapted to those who have no previous knowledge whatever of things relating to Botany. For absolute beginners the best type of book is undoubtedly the famous 'Lessons' in which Prof. Oliver has adapted the material provided by the late Professor Henslow. The very first sentence of that manual, "Gather, first of all, a specimen of the Common Buttercup," is a perfect example of the way a book should begin which is intended to make a science interesting to those who know nothing about it. And this gradual leading on from the known to the unknown is well maintained by Prof. Oliver. After a dozen pages the pupil is still dealing in a very simple but thorough fashion with his "Common Buttercup," and yet has already become acquainted with some of the leading truths of Botany, without encountering a single long word or a single complicated statement. Mr. Davis' method is entirely different; without any pretence of choosing a pleasant or easy path he boldly plunges *in medias res*.

In the first dozen *lines* the beginner, who is entirely without knowledge, has to master the terms Morphology, Histology, and

Physiology. Atoms and Molecules, Analogues and Homologues, Exosmosis and Endosmosis, Geotropism and Hydrotropism follow in quick succession. In the first few pages we get to Katabolism, though the neophyte is mercifully spared Anabolism. Diabolism, to which an acute medical student recently assigned much importance in matters botanic, has, I believe, not yet crept into any text-book.

The investigations we have pursued seem to lead to the conclusion that the book is not intended for those who are quite beginners; though the scientific accuracy of statement and the concise exposition of sound principles make it valuable for educational purposes. The assertion in the preface that no attempt has been made to "write up" (or "down") "to any syllabus," seems distinctly opposed to the statement on the title-page that it is "especially adapted for London Matriculation, South Kensington, and University Local Examinations." Whether, however, the adaptation was designed or is only accidental, it doubtless exists; and indeed it would be very hard to find a text-book which, studied after some easy introductory work such as Oliver's, would better guide the student to an accurate knowledge of those modern discoveries in the science of Botany, an acquaintance with which is not only desirable for its own sake, but extremely likely to "pay" at botanical examinations.

The chapter on the "Physiology of Flowers" is the best in the book. An admirable *résumé* is given, drawn from Darwin, Hermann Müller, Kerner, and Lubbock, of what is known of the fertilization of flowers. Pollination is carefully distinguished from fertilization, and one does not find the absurdly exaggerated estimate of the benefits of cross-fertilization which is so common in popular works on the subject. An appendix on Practical Work, and another containing a number of Examination Questions which have been set at the London University or South Kensington add much to the value of the book.

One has so frequently to complain of the absence or inadequacy of an index, that it is strange to meet with a book which is distinctly over-indexed. The number of subjects referred to is enormous, and some of them seem to be but remotely connected with Botany. Under the letter C, for example, besides a very long list of botanical terms, we find references to Cats, Cattle, Crams, and Cleanliness! Indeed some parts of the index are so full that they seem to have been drawn up on the model of Cruden's 'Concordance.' A short sentence, for instance, which tells that certain leaves have their edges directed north and south, may be found both under "North" and "South," as well as under six other entries. Single words given in an index often lead one on quite a wrong track. 'Browning,' standing thus in naked simplicity, tempts us to expect a refreshing rill of poetry amid an arid desert of scientific terminology; and it is somewhat disappointing to find, when we turn up the passage, that the information given is that a certain instrument-maker's shop is in the Strand, and in the S.W. postal division,—a statement which may be new, but is certainly not true. But it would be a very hypercritical reviewer who would grumble much at little matters like this, which, indeed, detract very slightly from the merits of Mr. Davis's useful volume. PERCY W. MYLES.

ARTICLES IN JOURNALS.

Annals of Botany (May). — G. F. Atkinson, 'Monograph of *Lemaneaceæ* of United States' (3 plates).—J. Wilson, 'Mucilage- and other Glands of *Plumbagineæ*' (4 plates). — G. F. Scott-Elliot, 'Fertilisation of *Musa*, *Strelitzia*, and *Ravenala*' (1 plate). — Id., 'Ornithophilous Flowers in S. Africa' (1 plate).—A Lister, '*Chondrioderma difforme* and other Mycetozoa' (1 plate).

Bot. Centralblatt (Nos. 18, 19). — R. Keller, 'Beiträge zur schweizerischen Phanerogamenflora.'—O. Böckeler, *Carex Christii*, n. sp.— —. Hartig, '*Trametes radiciperda*.'—R. Sernander, 'Ueber Pflanzenreste in den marinen Ablagerungen Skandinaviens.'—(Nos. 20, 21). E. Bünger, 'Beiträge zur Anatomie der Laubmooskapsel.' — J. Röll, 'Ueber die Warnstorf'sche *Acutifolium*gruppe der europäischen Torfmoose.'

Botanical Gazette (April 19). — C. Robertson, 'Flowers and Insects.' — A. P. Morgan, 'Mycological Observations.' — J. M. Coulter & W. H. Evans, 'Revision of N. American *Cornaceæ*.'— A. H. Hitchcock, 'Glandular pubescence in *Aster patens*.'

Botaniska Notiser (häft. 3).—H. W. Arnell, 'Om några *Jungermannia ventricosa* Dicks. närstående lefvermossarter.'—J. Lindvall, 'Om några enskilda herbarier i norden 1772.' — R. Jungner, 'Ett fall af fasciation hos *Berberis vulgaris*.'—K. Starbäck, 'Mygologiska notiser.' — A. G. Kellgren, 'Studier öfver Ombergsflorans papilionaceer.' — J. A. O. Skårman, '*Salix hastata* × *repens* nov. hybr.'— R. Sernander, 'Några bidrag till den norrländska kalktuff-floran.' —A. N. Lundstrom, 'Slutord i frågan om de regnuppfångande växterna.'

Bull. Torrey Bot. Club (May). — D. H. Campbell, 'Studies in Cell-division' (2 plates). — N. L. Britton, 'The naming of Forms.' —D. C. Eaton, *Buxbaumia indusiata*.

Gardeners' Chronicle (May 3). — J. Macfarlane, 'Microscopic Structure of Hybrids.'—*Zygopetalum caulescens* Rolfe, n. sp.—(May 10). *Calanthe rubens* Ridley, n. sp. — W. G. Smith, 'Truffles, true and false' (figs. 97, 98).—(May 24). *Tulipa ciliatula* Baker, n. sp. —*Bambusa palmata* Hort. (fig. 106). — H. T. Soppitt, *Æcidium Convallariæ*.

Journal de Botanique (April 1). — C. Sauvageau, 'Structure des feuilles des plantes aquatiques.' — B. Balansa, 'Graminées de l'Indo-Chine.'

Journ. Linn. Soc. (Botany, xxvii. 182). — G. Massee, 'Monograph of *Thelephoreæ*' (3 plates).

Oesterr. Bot. Zeitschrift (May). — M. Willkomm, 'Neue und kritische Pflanzen der Spanisch-portugiesischen und balearischen

Flora' (*Desmazeria balearica*, *D. triticea*, spp. nn.). — G. v. Lagerheim, *Puccinia Bäumleri*, n. sp.—K. Bauer, 'Untersuchungen über gerbstoffführende Pflanzen.' — J. Breidler, 'Zur Moosflora der Bukowina und Siebenbürgens.' — J. Dörfler, 'Zur Gefässkryptogamenflora der Bukowina.'

LINNEAN SOCIETY OF LONDON.

May 1, 1890.—Mr. J. G. Baker, F.R.S., Vice-President in the chair. The Rev. J. Tait Scott was admitted, and Messrs. J. H. Garrett and John Young, were elected Fellows; Dr. E. von Regel, of St. Petersburg, and Mr. Sereno Watson, of Harvard University, Cambridge, Mass., being elected Foreign Members.—Mr. Miller Christy exhibited and made remarks on specimens of the so-called Bardfield Oxlip, which he had found growing abundantly not only in the neighbourhood of Bardfield, Essex, but over a considerable area to the N. and W. of it.—Mr. Sherring exhibited a series of excellent photographs which he had taken near Falmouth, which showed the effects of climatic influence on the growth of several subtropical and rare plants cultivated in the open air.

OBITUARY.

Joshua Clarke, F.L.S., who died at Saffron Walden in February last, was born April 10th, 1805, at that place, and always resided there. From early life he devoted a great part of his time to the study of Natural History, and was one of the promoters of the Saffron Walden Museum, which was one of the best local museums in the country half a century ago. Joshua Clarke was particularly attached to British botany, and especially to local botany. He recorded two new British denizens, *viz.*, *Lathyrus tuberosus* Linn., and *Erucastrum Pollichii* Schimp. et Spenn., both of which he first noticed in Essex. He also wrote on the injury caused to barley by *Rhinanthus Crista-Galli*, Linn. His great contributions to science were, however, not his published writings, but his continuous efforts to promote the study of the Natural Sciences, especially Botany. He gave considerable time to the instruction of young men, and to encouraging them as collectors. His acquaintance with the local flora and his assistance are fully acknowledged in the preface to the 'Flora of Essex,' by his friend George S. Gibson. Joshua Clarke cultivated many of the rarer and more beautiful indigenous plants of Britain; and could often show a visitor the "Spider" or the "Fly" in his garden, though these Orchises rarely lasted a second season in captivity. He was ten years Mayor of Saffron Walden, and was always ready to encourage visits to his town by scientific societies and public lecturers. He was elected a Fellow of the Linnean Society in 1853.

SYNOPSIS OF THE GENUS *TUNICA*.

By Frederic N. Williams, F.L.S.

Plants referable to the genus *Tunica* are mentioned in very early botanical works. The earliest record I can trace is in the 'Castigationes Plinianæ' by Ermalao Barbaro, a Venetian diplomatist, logician and critic; a work published in 1492, the year before his death. He there speaks of a plant with a "florem garyophyllum," which is so distinct from other plants of the group that it has been classed by some herbalists among the Saxifrages. This doubtless refers to *Tunica saxifraga*. This is probably the species figured on p. 402 in the Kraüter-Buch of Adam Lonicer (1528—1586), and included among the "herbæ tunicæ." The earliest authenticated specimen is one labelled "Osteocollon hæmoroidalis" by Aldrovandi (1522—1605), which is preserved in the herbarium of the University of Bologna. On p. 1191 of the 'Hist. Gen. Plantarum' of Dalechamps (1513—1588) is a plant described as *Tunica minima*, which is the earliest instance in the history of the genus of a connominate pseudo-Linnean expression; and this plant can be identified with the species now known as *Tunica rigida*. The next reference to *Tunica saxifraga* is by Pona (1595), who speaks of it as "sassafragia di Paolo et di Dioscoride." It is figured by Jean Bauhin and also by Barrelier, and referred to by Ambrosini (1657) as "saxifragia antiquorum."

The genus *Dianthus* was founded by Linnæus in 1737, and in 1742 Haller revived the name of *Tunica* for plants included in the Linnean genus. In the 'Species Plantarum' (1753), Linnæus ignored Haller's revived name, though the latter as referring to the form of the calyx is preferable as a morphological expression to Linnæus' fancy name. Adanson, however, retained Haller's name. Scopoli, in the second edition (1772) of his 'Flora Carniolica' placed the same species under *Tunica* which in the first edition (1760) he had placed under *Dianthus;* and further, defined the genus:—"Calyx coriaceus, monophyllus, squamis adpressis ad basin vallatis. Petala 5. Capsula coriacea, unilocularis, quadrivalvis, polysperma." This may apply equally well to both. In subsequent works the species were arbitrarily grouped either in *Dianthus* or *Tunica:* a few new ones were included in *Gypsophila*. It was not until 1836 that Koch constituted *Tunica* a separate genus, distinct from *Dianthus* ('Syn. Fl. Germanicæ et Helveticæ,' p. 93). He says, "hoc genus differt a Gypsophila squamis et seminibus Dianthi, a Diantho petalis Gypsophilæ sensim attenuatis et faucem non claudentibus." Fenzl proposed to include the genus in *Dianthus* again (1842). Bentham and Hooker (1862) reckon about 10 species; Boissier, in the 'Flora Orientalis' (1867), enumerates 20, of which 4 species have been restored to *Dianthus*. In this synopsis 27 species are described; and references to published figures are given for 13 species.

The name of the genus probably has reference to the form of the

calyx, though Pirolle, a French horticulturist, derives it from "Tunis."

The description of the genus is so far amended as to include all the forms, as given here.

TUNICA.

Calyx campanulatus turbinatus obconicus clavatus vel tubulosus; 5-dentatus, 5-vel 15-nervius vittis commisuralibus late membranaceis enerviis rarius æqualiter 30-vel 35-nervius; basi bracteolis per paria imbricatis cinctus, vel nudus. Petala 5, basin versus sensim cuneato-attenuata, ungue elongato, laminâ integrâ retusâ vel bifidâ ecoronatâ. Torus parvus. Stamina 10. Ovarium uniloculare: styli 2. Capsula ovoidea vel oblonga polysperma, apice dentibus valvisve 4 dehiscens. Semina orbiculata vel discoidea, hinc convexiuscula illinc concava, ad medium faciei interioris umbilicata, alata vel aptera: embryo rectus, excentricus.—Herbæ, sæpius graciles rigidulæ at parvifloræ. Folia angusta. Flores solitarii laxe cymosi fasciculati vel capitati.

Sectio I. Dianthella.—Flores solitarii basi involucrati. Calyx tubulosus 30- v. 35-nervius, dentibus acuminatis. Annua.

1. T. pamphylica Boiss. et Bal.; Diagn. Pl. Nov. Or. ser. ii. 6, p. 27.—Glabra, 16 centim. Caules filiformes a basi dichotome ramosissimi. Folia anguste linearia subulato-attenuata trinervia. Pedicelli calyce 1–2-plo longiores. Bracteæ 8–12 decussatæ oblongæ acutæ multistriatæ, calyce triplo breviores. Calyx rubrostriatus dentibus lanceolatis. Lamina pallide rosea oblongo-spathulata obtusa.

Sectio II. Tunicastrum.—Flores solitarii basi bracteolis imbricatis involucrati. Calyx 5-v. 15-nervius, dentibus obtusis.

Subsectio 1.—Species monotocæ. Folia adpressa. Bracteæ acutæ, nervo herbaceo. Petala integra.

2. T. Peronini Boiss.; Fl. Orient. Suppl. p. 81.—Minute pubescens, 25 centim. Caules numerosi erecti a basi dichotome ramosi teretes. Folia lineari-lanceolata subulato-attenuata trinervia. Pedicelli calycem æquantes. Bracteæ 6 lanceolatæ, trinerviæ, calycem æquantes. Calyx 15-nervius oblongo-campanulatus dentibus oblongo-lanceolatis. Lamina albida linearis. Annua.

3. T. syriaca Boiss.; Diagn. Pl. Nov. Or. ser. i. 8, p. 63.—Glabra basi suffrutescens, 20 centim. Caules numerosi filiformes rigidi subsimplices uniflori. Folia anguste linearia acuta uninervia margine scabrida. Bracteæ 8–10 anguste lanceolatæ uninerviæ calyci subæquilongæ. Calyx 5-nervius oblongo-campanulatus dentibus oblongis. Lamina pallide rosea linearis. Biennis.

4. T. arenicola Duf.; Bull. Soc. Bot. France, vii. p. 240; Barrelier, ic. 997.—Glabra basi suffrutescens, 20 centim. Caules numerosi filiformes stricti ramosi. Folia lineari-subulata acuta margine scabra. Bracteæ 4 ovatæ uninerviæ. Calyx 15-nervius tubuloso-campanulatus. Lamina ovata supra albida subtus incarnata basi obsolete trilineata.

Subsectio 2.—Species polytocæ. Folia anguste linearia acuta uninervia margine scabra. Bracteæ mucronatæ omnino scariosæ. Petala emarginata v. retusa.

5. T. Gasparrini Guss.; Fl. Siculæ Syn. 1, p. 474.—Glabra cæspitosa. Caules 4–7 centim., ascendentes teretes. Folia patentia. Bracteæ 4–6 oblongæ. Calyx turbinatus 5-nervius. Lamina pallidissime colorata emarginata.

6. T. saxifraga Scop.; L. Sp. Plantarum, ed. i. p. 413 (*Dianthus saxifragus*); Sibth. Fl. Græca, iv. tab. 382 (*Gypsophila rigida*); Rchb. Ic. Flor. Germ. 5006; Jord. et Fourr., Brev. Pl. Nov. tab. 44, 45 (varr.).—Glabra aut scabra, 16 centim. Caules numerosi graciles ascendentes vel a basi diffusi paniculati, teretes. Folia adpressa. Bracteæ 4 oblongo-lanceolatæ carinatæ scariosæ calyce breviores. Calyx tubuloso-campanulatus 15-nervius nervis lateralibus obscurioribus dentibus triangulari-ovatis. Lamina albida v. sæpius rosea obcordato-cuneata retusa v. erosa lineis saturatioribus purpurascentibus picta.

Var. *capillacea* Ser.; DeCandolle, Prod. i. p. 354.
Var. *hispidula* Ser. ,, ,,
Var. *scabra* Schult.; Oestr. Fl.
Var. *asperula* Duf. (herb. Cosson).
Var. *bicolor* Jord. et Fourr.; Brev. Pl. Nov. p. 10 (1866).
Var. *erecta* Jord. et Fourr.; Brev. Pl. Nov. p. 10 (1866).
Var. *xerophila* Jord. et Fourr; Brev. Pl. Nov. p. 10 (1866).

This is the plant figured and described by Jean Bauhin (Hist. Univ. Plant. 3, p. 337, f. 2) as "Betonica coronaria"; and by Barrelier (Plant. Obs. Ic. tab. 998) as "Lychnis pumila caryophyllata flore rubello." Described also by Pona (1595), and by Cupani (1696). By Linnæus it was included in *Dianthus*, and by DeCandolle in *Gypsophila*.

Sectio III. Eutunica.—Flores fasciculati v. capitati. Capitulum basi phyllis scariosis involucratum. Calyx 5-v. 15-nervius. Polytocæ.

Subsectio 1. — Folia uninervia adpressa. Involucri phylla tenuiter uninervia. Calyx 5-nervius. Petala retusa v. integra.

7. T. dianthoides Boiss.; Sibth. Flora Græca, iv. p. 76, tab. 383. (*Gypsophila*.)—Glabra basi suffruticosa multicaulis, 18–27 centim. Caules graciles ascendentes stricte ramosi. Folia subulata acuta margine lævia. Fasciculi 3–5-flori. Involucri phylla lanceolata acuta calyce subbreviora. Calyx turbinatus dentibus ovato-lanceolatis acutis. Lamina alba sanguineo-venosa oblongo-spathulata obtusa.

8. T. thessala Boiss.; Diag. Pl. Nov. Or. ser. i. 8, p. 63.—Glabra basi suffruticosa multicaulis, 21-28 centim. Caules tenues rigidi juncei simplices v. superne stricte ramosi et angulati. Folia anguste linearia acuta margine serrulata surculorum fasciculata. Capitula densa 5–10-flora. Involucri phylla ovata mucronata calycem æquantia. Calyx turbinatus dentibus oblongo-linearibus obtusis. Lamina albida lineari-lanceolata obtusa.

9. T. FASCICULATA Boiss.; Marg. et Reut. Mem. Soc. Physic. Genev. viii. p. 281, tab. i. (*Gypsophila*).—Parce glanduloso-hirta basi suffruticosa multicaulis, 20–25 centim. Caules filiformes erecti ramosi inferne foliosi. Folia 4–7 mm. lineari-subulata obtusiuscula margine lævia. Flores fasciculato-capitati. Pedicelli calyce breviores. Involucri phylla linearia obtusa calyce duplo breviora. Calyx tubuloso-campanulatus, dentibus oblongis obtusis. Lamina alba lineari-cuneata retusa.

Subsectio 2. — Folia uninervia adpressa. Involucri phylla valide carinata. Petala obtusa integra. Calyx 15-nervius.

10. T. ORPHANIDESIANA Clem.; Sert. Orient. p. 17, tab. 5. — Glabra basi suffrutescens, 24 centim. Caules numerosi tenues stricti simplices juncei angulati superne parce ramosi. Folia inferiora subfasciculata obtusa superiora linearia acuta, margine serrulato-aculeata. Capitula 5–10-densiflora. Involucri phylla ovata mucronulata calycem æquantia. Calyx turbinatus dentibus oblongo-lanceolatis obtusis. Lamina purpurascens lineari-lanceolata.

11. T. MACRA Boiss. et Haussk.; Fl. Orient. Suppl. p. 81. — Glanduloso-puberula, 35 centim. Caules erecti dichotome ramosi. Folia inferiora lineari-oblonga, superiora subulata. Fasciculi 2–4-flori. Involucri phylla triangulari-lanceolata acuta calyce breviora. Calyx tubulosus dentibus oblongis obtusis, nervis lateralibus obscurioribus. Lamina alba linearis.

12. **T. gracilis** mihi in Herb. Kew.—Glauca asperula, 38 centim. Caules graciles stricti tenues ascendentes, sparsim foliati, superne plusminus dichotome ramosi. Folia 2–3 mm., minuta anguste linearia acuminata margine lævia, infimis latioribus. Fasciculi 3–5-flori. Involucri phylla 4–6 ovata acuminata calyce triplo breviora. Calyx hispidus clavatus dentibus ovato-lanceolatis acutis. Lamina alba oblongo-spathulata.

Collected by Prof. Haussknecht in 1867, on rocks of Mt. Lhahu in Kurdistan. Similar to the preceding, but of a glaucous and more graceful habit; and differs further in its very small leaves, broader bracts and fuller calyx.

13. T. RIGIDA Boiss.; L. Sp. Plantarum, ed. 1, p. 408 (*Gypsophila*). — Puberula pumila. Caules 13–15 centim. ascendentes corymbose paniculati teretes. Folia subulata acuta margine scabrida. Flores 2–5-fasciculati. Involucri phylla ovato-oblonga mucronulata calyce subbreviora. Calyx obconicus dentibus ovatis obtusis. Lamina albida oblongo-spathulata supra lineata.

This is the veritable *Tunica minima* of Dalechamps (1513—1588), described on p. 1191 of his 'Historia,' published the year before his death. Included by Linnæus in *Gypsophila*. The *Gypsophila rigida* figured in the 'Fl. Græca,' tab. 382, is *T. saxifraga*. The *Tunica* of Rupp, in 'Fl. Jenensis,' p. 105 (1718) includes only species now included in *Dianthus*.

Sectio IV. GYPSOPHILOIDES.—Flores solitarii basi nudi. Calyx tenuiter 5-v. 15-nervius. Polytocæ.

Subsectio 1.—Calyx 15-nervius campanulatus v. turbinatus.

14. T. GRAMINEA Boiss.; Smith, Prodr. Fl. Græcæ, 1, p. 279 (*Gypsophila*).—Hirtula cæspitosa. Caules 18–30 centim., numerosi ascendentes stricti paniculati pauciflori. Folia setaceo-triquetra, incurva uninervia surculorum fasciculata margine scabrida. Pedicelli viscido-hispiduli calyce 1–3-plo longiores. Calyx hispidus campanulatus dentibus rotundatis obtusis. Lamina rosea obcordata.

15. T. PHTHIOTICA Boiss. et Hldr.; Fl. Orient. Suppl. p. 82.—Glabra pumila. Caules ascendentes foliosi dichotome ramosi. Folia anguste linearia acuta uninervia incurva. Pedicelli calyce duplo longiores. Calyx obconicus dentibus triangularibus acutis. Lamina rosea oblongo-spathulata obtusa.

16. T. CRETICA Fisch. et Mey.; Sibth. Fl. Græca, iv. p. 76, tab. 384 (*Gypsophila*).—Viscido-pubescens cæspitosa. Caules ascendentes tenues parce et dichotome ramosi. Folia lineari-lanceolata acuta trinervia adpressa margine lævia. Pedicelli longi. Calyx campanulatus dentibus triangularibus acuminatis. Lamina alba subtus rubro-lineata oblonga retusa.

Referred to by Cupani in his 'Hortus Catholicus' (1696), as "Caryophyllus gramineus saxatilis, flosculis in umbellam candidis." Linnæus' description of *Saponaria cretica* is too incomplete to identify it with this species. The plant was transferred to this genus by Fischer and Meyer in 1837.

17. T. HAYNALDIANA Janka; Pl. Exsiccat. ex Itin. Banat. (1870). Puberula 28 centim. Caules numerosi rigidi dichotome ramosi. Folia anguste linearia acuminata patentia trinervia margine scabra, 15–27 mm. Pedicelli calycem æquantes. Calyx hirsutus anguste turbinatus dentibus triangulari-ovatis. Lamina albida ovata integra.

18. T. SIBTHORPII Boiss; Diagn. Pl. Nov. Or. ser. i. 8, p. 61; Fl. Græca, iv. tab. 386 (*Gypsophila illyrica*).—Viscido-pubescens. Caules numerosi foliosi erecti rigidi inferne teretes simplices superne angulati in paniculam brevem confertam abeuntes. Folia anguste linearia acuta adpressa trinervia margine scabra. Pedicelli calyce breviores. Calyx oblongo-conicus dentibus oblongo-ovatis acuminatis. Lamina alba oblonga integra basi sæpe purpureo-punctata.

19. T. ARMERIOIDES; Ser. *in* DC. Prodr. 1, p. 353 (*Gypsophila*).—Cæspitosa viscido-pubescens. Caules numerosi erecti rigidi dichotome paniculati. Folia linearia obtusa adpressa. Calyx turbinatus dentibus triangularibus acutis. Lamina spathulata integra.

Subsectio 2.—Calyx 5-nervius, tubulosus.

20. T. OCHROLEUCA Fisch. et Mey.; Sibth. Fl. Græca, iv. p. 77, tab. 385 (*Gypsophila*).—Glabra glauca multicaulis. Caules 21–27 centim., linearia acuminata patentia trinervia margine scabrida. Calyx dentibus triangularibus acuminatis. Lamina spathulato-linearis integra pallide ochroleuca basi purpureo-ocellata.

21. T. COMPRESSA Fisch. et Mey.; Desf. Fl. Atlantica, 1, p. 343, tab. 97 (*Gypsophila*).—Viscido-pubescens basi suffruticosa. Caules 21–27 centim., erecti tenues superne compressi inferne teretes,

paniculatim ramosi. Folia 22–25 mm., lineari-lanceolata acuminata adpressa trinervia margine scabrida. Calyx dentibus ovatis acutis. Lamina oblonga integra superne alba subtus lineis violaceis picta.

Sectio V. Pleurotunica. — Flores solitarii basi nudi. Calyx valde quinquecostatus, costis 1 v. 3-nerviis. Monotocæ.

Subsectio 1.—Folia patentia. Calyx costis uninerviis. Petala integra.

22. T. illyrica Fisch. et Mey.; Linn., Mantissa, p. 70 (*Saponaria*); Rchb., Ic. Flor. Germ. 4999.—Viscido-pubescens, plusminus cæspitosa basi suffrutescens. Caules numerosi rigidi laxe et divaricatim dichotomi. Folia anguste lineari-subulata recurva trinervia margine scabra. Flores approximati. Calyx hirsutus tubuloso-campanulatus, dentibus triangulari-ovatis mucronatis. Lamina oblonga, supra pallide ochroleuca subtus purpureo-lineata basi purpureo-punctata. Biennis.

Var. *Taygetea* Boiss.; Fl. Orient. 1, p. 521.

Var. *flava* Huter; Pl. Exsiccat. Ex Itin. Italico, iii. no. 256 (Herb. Kew).

This species includes the following plants:—

Saponaria Illyrica L., which certainly does not occur in Illyria, and therefore the trivial name proposed by Linnæus is not appropriate.

Gypsophila cretica Griseb. in Spicil. Fl. Rumel. Bithyn. 1, p. 184. *T. cretica*, for which the plant may have been mistaken, does not occur in the Balkan provinces.

Fiedleria illyrica Rchb., representing a genus which has not been maintained.

23. T. Davæana Cosson; Bull. Soc. Bot. France, xxxvi. p. 103. —Viscido-pubescens 16–20 centim. Caules erecti rigidi laxe et divaricatim dichotomi. Folia anguste lineari-subulata trinervia stricta margine scabra. Pedicelli calyce longiores. Calyx clavatus dentibus ovato-lanceolatis mucronatis. Lamina oblongo-spathulata purpurascens. Annua. — Cyrenaica in Africa boreali (in horto Musei Parisiensis culta).

24. T. stricta Bunge in Fl. Altaïca, ii. (1830), p. 129 (*Gypsophila*); Ledebour in Ic. Pl. Ross. tab. 15.—Glabra 25 centim. Caules numerosi erecti strictissimi basi racemose ramosi. Folia brevia uninervia incurva margine scabra radicalia flaccida rosulata lineari-spathulata, caulinia late linearia acuta. Pedicelli calyce 2–5-plo longiores. Calyx turbinatus dentibus triangularibus acutis. Lamina albida oblongo-linearis. Biennis.

Subsectio 2.—Folia patentia trinervia. Calyx costis trinerviis.

25. T. pachygona Fisch. et Mey.; Ind. Sem. Petropolit. iv. p. 50.—Glanduloso-viscida. Caules 13–20 centim., erecti rigidi a medio dichotome paniculati. Folia linearia acuta margine lævia. Pedicelli calyce sublongiores. Calyx glaber campanulatus dentibus triangulari-ovatis mucronatis. Lamina alba lineari-spathulata integra subtus trilineata. Annua.

Var. *hirtituba* mihi = *T. arabica* Boiss.

26. T. BRACHYPETALA Jaub. et Spach; Illustr. Pl. Orient. 1, p. 11, tab. 5.—Infra glabra supra glanduloso-puberula. Caules 25–35 centim., erecti a basi dichotome paniculati. Folia lineari-filiformia acuta margine lævia. Pedicelli calyce sublongiores. Calyx campanulatus dentibus ovatis acuminatis. Lamina albida spathulata integra subtus rubella trilineata. Biennis.

27. T. HISPIDULA Boiss. et Hldr.; Diagn. Pl. Nov. Or. ser. i. 8, p. 62.—Viscido-hispidula 21–25 centim. Caules a basi dichotome et effuse ramosissimi paniculam divaricatam formantes. Folia anguste linearia acuminata margine lævia. Pedicelli calyce 3-4-plo longiores. Calyx obconicus dentibus ovatis mucronatis. Lamina bifida, albida v. ochroleuca. Annua.

? *Saponaria* sp. Cf. *S. orientalis* L. in sect. *Proteinia.*

CHRONOLOGICAL SEQUENCE OF THE SPECIES.

Linnean species.—Three of the species included in this Synopsis were described by Linnæus, each of which is to be found under a different genus.

Gypsophila rigida (1753) = *T. rigida* Boiss.
Dianthus saxifragus (1753) = *T. saxifraga* Scop.
Saponaria illyrica (1767) = *T. illyrica* Fisch. et Mey.

The post-Linnean species up to 1824.— Six species belong to this period; they include:—

T. compressa (1798) of Algeria.

T. graminea (1806). Neither described nor figured afterwards in the 'Fl. Græca' with the next three species.

T. dianthoides, cretica, and *ochroleuca,* in the 'Fl. Græca' (1823).

T. armerioides (1824) of Anatolia.

FROM THIS DATE TO THE COMPLETION OF BOISSIER'S 'DIAGNOSES' (1859).—During this period eleven more species were described; they are:—

T. stricta (1830), in Central Asia.

T. pachygona (1837), in Western Asia.

T. fasciculata (1841). Transferred from *Saponaria* by Boissier in 'Suppl. Fl. Orient.' (1889).

T. Gasparrini and *T. brachypetala* (1842).

T. thessala, syriaca, Sibthorpii, and *hispidula;* described in the first series of Boissier's 'Diagnoses' (1849).

T. Orphanidesiana, from Mt. Parnassus (1855).

T. pamphylica, described in Boissier's 'Diagnoses,' ser. ii. fasc. 6, p. 27 (1859).

FROM 1860 TO THE PRESENT YEAR seven species have been added:—

T. arenicola (1860).

T. Haynaldiana (1870).

T. Peronini, macra, and *phthiotica,* described in Boissier's 'Suppl. Fl. Orient.' (1889).

T. Davæana (1889). Found by J. Daveau, in Tripoli.

T. gracilis (1890). Recorded from Mt. Lhahu, in Kurdistan.

It may be noted, in conclusion, that the genus is chiefly confined to the countries of the Mediterranean littoral.

HEPATICÆ FOUND IN KERRY, 1889.

By Reginald W. Scully, F.L.S.

Kerry is well known to be the happy hunting ground for those who are interested in *Hepaticæ*, a reputation which has drawn to this south-west extremity of the British Isles nearly every specialist in these somewhat difficult plants. The number of *Hepaticæ* recorded as occurring in Ireland, after deducting two or three as impositions or ambiguities, is at present about 146 species ; of this number no less than 133 have been at one time or another stated to have been found in Kerry, a result no doubt due to the careful exploration this beautiful county has received, and even still scarcely a year passes without an addition to the list. In the hope that some of the missing thirteen may be found, I have added their names after the following list of localities, together with those of a few others for which recent observations or further localities are very desirable.

My Kerry collection of last summer contained specimens of as many as 104 species. A few of these were new to the county, while fresh localities were found for some of the rarer species. The most interesting of the additions was *Petalophyllum Ralfsii*, known already in Ireland from two spots near Dublin, and in England from Cornwall. It occurred in two localities among the sand-hills round Ballinskelligs Bay, near Waterville, very fine and abundant in one of them. I also found *Fossombronia angulosa* in great abundance round this same bay, a welcome extension to the very restricted range of this beautiful species. It occurred in dense tufts or masses, often filling small hollows in the damp cliffs or fissures in the rocks nearly down to sea-level; unlike most *Hepaticæ*, this species loses all its beauty in drying. *Nardia sphacelata*, *Scapania subalpina*, *S. æquiloba*, *Jungermannia nana* and *J. bicrenata* are probably additions to the county.

I cannot too much thank Mr. David McArdle, of the Royal Botanic Gardens, Glasnevin, for his kindness in examining my numerous specimens; I could not have attempted the publication of the following localities without the help of his critical knowledge of these difficult plants. I have not repeated localities already known, unless with the object of showing the height at which the plants were gathered, &c.

Dumortiera irrigua Nees. Blackwater Bridge, Kenmare Bay, and recorded from here by Dr. Taylor in 1820.

Targionia hypophylla L. Blackwater Bridge, Kenmare Bay, and near Muckross Abbey, Killarney.

Frullania Hutchinsiæ var. *integrifolia* Nees. Growing on *Dumortiera* at Torc Waterfall, Killarney. — *F. tamarisci* Dum. Many localities, from sea-level to 2500 ft. on the Reeks.

Lejeunea calyptrifolia Dum. Growing on *Frullania tamarisci* near the Hunting Tower, Upper Lake, Killarney. — *L. hamatifolia* Hook. On *Frullania* and *Metzgeria*, Glencar ; Waterville ; Blackwater Bridge, &c. — *L. echinata* Tayl. Ross Island, Killarney.— *L. Rossettiana* Massal. Ross Island, Killarney, confirmed by Dr.

Spruce. — *L. microscopica* Tayl. Many places from sea-level to 1500 ft. — *L. ovata* Tayl., *L. serpyllifolia* Libert, *L. patens* Lindb., *L. flava* Swz., and subsp. *albida* Spruce. Abundant in many localities from sea-level, as at Blackwater Bridge, to 2500 ft. on the Reeks.

Radula xalapensis N. M. Darrynane; Torc Waterfall; Mangerton; 2500 ft. on the Reeks, &c. — *R. aquilegia* Tayl. Near Waterville; Mangerton; Slieve Mish Mts. at 1500 ft.

Porella lævigata Lindb. Near Waterville.

Bazzania trilobata B. Gr. Glencar; 2500 ft. on the Reeks, &c. —*B. triangularis* Schleich. Upper Glencar.

Cephalozia divaricata Smith. Waterville; Glencar; about Killarney. — *C. elachista* Jack. Near Waterville; Upper Glencar; 2500 ft. on the Reeks, &c.—*C. connivens* Dicks., *C. catenulata* Lindb., and *C. uliginosa* Spruce. In many places to 2500 ft. on the Reeks. —*C. curvifolia* Dum. and *C. multiflora* Spruce. Glencar, and near Killarney.

Lophocolea spicata Tayl. Glencar; Mangerton, &c.

Harpanthus scutatus Spruce. O'Sullivan's Cascade, &c., Killarney.

Kantia trichomanis B. Gr. With abundant colesules near the Hunting Tower, Upper Lake, Killarney.— *K. arguta* Lindb. Near Hunting Tower, Upper Lake, Killarney.

Trichocolea tomentella Dum. Blackwater Bridge, Kenmare Bay, &c.

Anthelia julacea Dum. Horses Glen, Mangerton.

Blepharostoma trichophylla Dum. Glencar; Torc Mtn., &c., Killarney.— *B. setacea* Mitt. Glencar; Mangerton, &c., Killarney.

Scapania compacta Dum. Near Waterville and Killarney.— *S. subalpina* Dum. Slieve Mish Mts., 1500 ft.; Reeks, 2500 ft.— *S. nimbosa* Tayl. Growing sparingly among *Diplophyllum*, Glencar. —*S. uliginosa* Dum. Near Waterville. — *S. æquiloba* Dum. Near Hunting Tower, Upper Lake, Killarney, and about 2500 ft. on the Reeks. — *S. nemorosa* Dum. and *S. umbrosa* Dum. From near sea-level to 2500 ft. on the Reeks. — *S. curta* Dum. Near Blackwater Bridge, Kenmare Bay.

Plagiochila punctata Tayl. Blackwater Bridge, Kenmare Bay; Glena, Killarney.—*P. tridenticulata* Tayl. Torc Waterfall; Glena, &c., Killarney.

Jungermannia cuneifolia Dum. Near Waterville; Glena and the Upper Lake, Killarney. — *J. crenulata* Smith, and var. *gracillima*. Waterville; Glencar, &c. — *J. pumila* Dum. Near Waterville; Blackwater Bridge, &c.—*J. cordifolia* Dum. Near Hunting Tower, Upper Lake, Killarney.—*J. sphærocarpa* Dum. Waterville; Glencar; Mangerton. — *J. nana* Nees. Blackwater Bridge, Kenmare Bay.—*J. orcadensis* Hook. Glencar, and at 2500 ft. on the Reeks, growing among *Sphagnum* and *Bartramia fontana*. — *J. exsecta* Schmidel. Glencar. — *J. intermedia* Lindenb. Near Hunting Tower, Upper Lake, Killarney. —*J. ventricosa* Dicks. Slieve Mish Mts., and about 2500 ft. on the Reeks, &c. — *J. bicrenata* Lindenb. At about 2500 ft. on the Reeks.—*J. incisa* Schrader. Near Hunting

Tower, Upper Lake, Killarney; about 1500 ft., Slieve Mish Mts. —*J. laxifolia* Dum. O'Sullivan's Cascade, Killarney; 1500 ft. on Slieve Mish Mts., &c.—*J. inflata* Dum. Upper Glencar.

Nardia sphacelata Giesecke. Horses Glen, Mangerton. — *N. compressa* Carring. Hunting Tower, Upper Lake, Killarney. — *N. obovata* Carring. Many places from near sea-level to 1500 ft. on Slieve Mish Mts. — *N. hyalina* Carring. Glencar, and about 1500 ft. on Pap's Mts., Killarney.

Adelanthus decipiens Mitt. About Upper Lake, Killarney.

Fossombronia pusilla Nees. Waterville, and near Hunting Tower, Upper Lake, Killarney.— *F. angulosa* Raddi. Abundant in many places round Ballinskelligs Bay; hitherto recorded only from Dingle Bay.

Petalophyllum Ralfsii Wilson. Sparingly among sand-hills on the south side of Inny Ferry, Waterville, and abundant about a mile west of the ferry on the north side.

Blasia pusilla L. Near Waterville and Ballybunnion.

Metzgeria hamata Lindb. Upper Glencar; Torc Waterfall, and at 2500 ft. on the Reeks. Dr. Moore's records for *M. linearis* should be transferred to this, as *M. hamata* was the plant intended. I understand that *M. linearis* is not British, nor likely to be so.— *M. conjugata* Lindb. Glencar.

Riccardia palmata Carruth. Mangerton; Muckross, &c., Killarney. — *R. pinguis* Gray. Waterville; Glencar, &c.—*R. latifrons* Lindb. Upper Glencar; Torc Waterfall, Killarney.

The following are the thirteen Irish *Hepaticæ* which have not yet been found in Kerry, so far as I am aware:—

Riccia fluitans L. and *R. natans* L. Recorded from Limerick, &c.

Porella Cordæana Dum. Fermoy, Co. Cork.

Odontoschisma denudatum Dum. Near Bangor, Mayo, 1859.

Cephalozia Francisci Hook. Bantry.

Pedinophyllum pyrenaicum Spruce. Ben Bulben, Sligo.

Jungermannia minuta Crantz. Co. Dublin and Wicklow. — *J. Lyoni* Tayl. Co. Wicklow.—*J. capitata* Hook. Bantry.—*J. excisa* Dicks. Recorded from the Dublin Mts. by Dr. Taylor more than sixty years ago, but Dr. Moore knew of no Irish specimens.

Nardia Funckii Carring. Belfast and Co. Galway.

Pallavicinia hibernica Gray. Co. Dublin.

Metzgeria pubescens Raddi. Co. Antrim.

Of the above it will be observed that the two *Ricciæ* are found in Co. Limerick on the north, and that *Cephalozia Francisci* and *Jungermannia capitata* have been found at Bantry, close to the southern boundary of Kerry. Recent observations or further localities in Kerry for any of the following would also be very welcome:—

Porella Thuja Dicks. Brandon, 1864.

Cephalozia Turneri Lindb. Near Upper Lake, Killarney, 1873, *Dr. Lindberg*.

Scapania irrigua Nees. Found in Kerry by Dr. Taylor and Dr.

Moore. — *S. planifolia* Hook. Brandon only, *Dr. Taylor* and *W. Wilson.*

Diplophyllum obtusifolium Dum. Found more than sixty years ago by Dr. Taylor near Dunkerron.

Jungermannia Dicksoni Hook. Connor Hill, *Dr. Moore.* — *J. Bantriensis* Hook. Brandon, *Dr. Moore.* — *J. Hornschuchiana* Nees. Near Upper Lake and Torc Mtn., Killarney, 1869, *Dr. Moore.*

Acrobolbus Wilsoni Nees. *W. Wilson*, 1829; *Dr. Taylor*, 1841.

Scalia Hookeri Gray. One solitary female plant on Connor Hill, 1873, *Dr. Lindberg.*

Anthoceros lævis L. Abundant near Ventry, *Dr. Lindberg* and *Dr. Moore*, 1873.

ON *POTAMOGETON FLUITANS* ROTH.

BY WILLIAM H. BEEBY.

THE object of the present paper is to try to throw a little light on the proper application of this name. A good deal that has been written on the subject hitherto seems scarcely more than conjecture; while a definite statement, like that of Reichenbach, which surely deserves to be accepted or refuted, or at least to be remarked upon, is passed over in silence.

The freely-fruiting plant of the Continent, called by many "*P. fluitans*," has been assumed to be the plant of Roth; and this assumption once having been made, fruit is sometimes asked for to prove that any given example is the plant of Roth! Unfortunately Roth did not describe the fruit at all; and as it appears to have been impossible to find a type specimen of Roth's plant, the conception of the fruit of *P. fluitans* Roth, can scarcely come from an authentic source. As Roth does not give descriptions of the fruit in this genus, the identification of his plant must, in the absence of authentic specimens, rest on other characters and considerations.

Reichenbach (Ic. Fl. Germ. et Helv., t. 49, 48) figures two plants which he regards as varieties of the same species, *viz.*, his typical sterile *P. fluitans* Roth, in a plate which well represents the British plant; and his fertile "*β. stagnatilis* Koch." Speaking of our sterile plant he says, "No one seems to have seen the typical form in fruit, which is known to me in no collection." Now, where there exist two forms, the one fertile and the other sterile, and supposed to belong to the same species, the almost universal custom is to call the fertile plant the type; and it is not likely that Reichenbach chose the opposite arrangement merely from caprice. The inference is rather that he took the more unusual course because, for some reason known to himself, he felt that he had no choice; especially when his remarks on the sterility of the typical form are taken into consideration. And it may be pointed out that the idea of sterility did not altogether originate with Reichenbach, for Chamisso and Schlechtendal say, "Semina, ex Nolte, acutius carinata quam natantis, *attamen non satis matura observabantur.*"

It may be well to quote Roth's own description of his plant. It is as follows:—

"P. foliis inferioribus longissimis, lanceolatis, acuminatis, membranaceis; superioribus ovali-lanceolatis, coriaceis; omnibus petiolatis."—Tent. Flo. Germ. tom. i. p. 72.

Leaving fruiting characters out of consideration, it would not be easy to give briefly a better description of our sterile form than this. My contention therefore is:—First, that the demand for fruit, wherewith to prove that any plant is *P. fluitans* Roth, must be withdrawn, or the evidence whereon the demand is based be divulged; and secondly, that the name *P. fluitans* Roth, must be withheld from the freely-fruiting continental plant, until it is shown to produce the characteristic submerged leaves described by Roth, and which have been entirely wanting on the few specimens of fruiting "*P. fluitans*" seen by myself, and wanting, so far as I can ascertain, on all specimens of fruiting "*fluitans*" that have been seen in this country.

I am not prepared to deny that these two forms may possibly be varieties of the same species, for I know too little of the fruiting plant; but if they are, it has yet to be shown conclusively, and meanwhile I most confidently hold the contrary opinion myself. I do not doubt that our *P. fluitans* is a hybrid *P. natans* × *lucens*, and at the same time should not be at all surprised were a ripe nut occasionally found. Such is no evidence of non-hybridity, but merely of the hybrid being occasionally fertilised by the pollen of some other (probably one of the parent) forms. In these sterile hybrids it appears to be the male element that is mostly at fault; and although its own pollen may be impotent, the pistil of the hybrid may still be susceptible to the good pollen of an allied form, in accordance with the law, acknowledged as general though not absolute, that "the male organs of species-hybrids are functionally weak to a higher degree than the female organs."

In conclusion, I may state that by the "British plant" I allude to the gatherings of Mr. Alfred Fryer in Hunts and Cambridgeshire, and by myself in Surrey and West Sussex.

RUBUS ERYTHRINUS GENEV.

By T. R. Archer Briggs, F.L.S.

In the 'Flora of Plymouth' there will be found appended to the particulars under *Rubus Lindleianus* Lees, at page 112, a reference to another bramble, which Dr. Focke, in his valuable and interesting 'Notes on English Rubi,' recently published in the 'Journal of Botany' (vol. xxviii. p. 97–103, 129–135), asserts to be the one given in Genevier's 'Essai Monographique sur les Rubus du Bassin de la Loire' as *Rubus erythrinus*. The paragraph respecting it which I published in 1880 is as follows:—"We have a bramble very common about Plymouth, certainly of the *Rhamnifolii* group, and allied to *Lindleianus*, which will, I believe, have to be described as a new species, should it not be found to be identical with some Continental one." We now find the possibility thus hinted at established as a fact in the opinion of Dr. Focke, for he in his "Notes" (Journ. Bot. xxviii. 102, 3) calls this plant *R. erythrinus* Genev., without question. It will be seen that I had the pleasure last summer of showing it to him in many spots near Plymouth, and that he also saw it with the Rev. W. Moyle Rogers and myself near Daggons, Dorset. It is in compliance with his expressed wish that I should say something about it that I write this notice, and give the following description:—

'RUBUS ERYTHRINUS' Genev., Focke in Journ. Bot. xxviii. 102, 3.

Stem strong, arching, angular, glabrous, or with few short hairs, of a dull dark purplish red in exposure, shining. *Prickles* on the angles, uniform, of moderate length, purplish red with yellow points, strong, sharp, slightly declining from an oblong compressed base. *Leaves* 5-nate. *Leaflets* thin, bright green, shining above, with very few distant hairs or glabrous, rather thickly clothed with short hairs beneath; irregularly but not very deeply dentate, or dentate-serrate, flat, or very slightly waved just at the edges, sometimes convex; lower oblong with short point; intermediate obovate-acuminate; terminal long-stalked, broadly obvovate-, or even oval-acuminate, somewhat cordate at the base; petioles with many strong hooked prickles, thinly hairy; stipules linear-lanceolate.

Flowering shoot rather long and narrow, with few hairs on the lower portion of the stem; *prickles* on the angles, somewhat scattered, small but strong, slender, declining. *Leaves* 3-nate, sometimes 5-nate. *Leaflets* thin, shining above, obovate or oval-acuminate; lower with short point. *Panicle* often compound, of moderate length, hairy, densely so and sometimes felted towards the top, sub-pyramidal in outline, being abruptly rounded at the top; *branches* short and few-flowered, rather lax, separate for at least two-thirds the length of the panicle; axillary ascending; ultra-axillary sub-patent; lateral *peduncles* about equal to or exceeding in length the peduncle of the terminal flower in each division of the panicle; *prickles* not abundant, strong, declining. *Leaves* sometimes felted beneath towards the top. *Sepals* ovate, with short linear points, hairy, felted within and without, reflexed. *Petals* large, oval, regular, pink. *Filaments* long, white. *Anthers* fuscous. *Styles* dull yellowish green. *Fruit* large, black, oblong, abundantly produced.

This plant differs from *R. Lindleianus* in being much less prickly, in having larger and broader flat or convex leaves with dentate, or obscurely dentate-serrate, divisions; when any waving is present it is only close to the edges. Also in having the panicle more pyramidal and less cylindrical, with distant branches below, and by far the larger number separate from one another; in having flowers with pink or tinted, not milk-white, petals, and in producing large fruit.

There are few characters by which to separate it from *R. rhamnifolius* W. & N., Anglor., but it has a markedly different appearance from the ordinary form of that bramble, partly by reason of the leaflets having dentate or irregularly dentate-serrate, not finely cut and very regular, divisions. It is also unlike it in having pink or tinted petals, and in the leaves being less frequently felted.

I quote Dr. Focke as the authority for considering the plant about which I am writing as essentially the *R. erythrinus* of Genevier; yet a reference to the work of the latter, 'Essai Monographique sur les Rubus du Bassin de la Loire' (I have only ed. 1, 1869, to which to refer), will show some want of agreement between my description of the Plymouth plant and his of *R. erythrinus*, and the points of dissimilarity would have made me hesitate to combine the two on my own responsibility.

This bramble is extremely abundant, and grows with great luxuriance, in many parts of Cornwall and Devon, evidently finding in these south-western counties conditions well suited to its requirements. Apart from the neighbourhood of Plymouth I have, in Cornwall, seen it in plenty near Bodmin, in the parishes of Blisland, St. Tudy, St. Mabyn, and Cardinham; also in abundance in the neighbourhood of Launceston.

In South Devon.—At Buckfastleigh and Diptford, Newton Abbot, Cockington, Kingskerswell, near Chagford, Gidleigh, Throwleigh, Haldon and elsewhere near Exeter.

N. Devon.—Okehampton. Specimens collected by Mr. W. P. Hiern, from the parishes of North Molton, N. Tawton, Symbridge, and Bishop's Nympton.

S. Somerset.—Blackdown, below the Wellington Monument; collected in company with the Rev. R. P. Murray in 1883.

Dorset.—Arne. Found in considerable quantity by the Rev. W. Moyle Rogers and myself in 1886. In the following year I saw it also, but in small quantity, at Branksome Chine.

S. Hants.—Met with by the Rev. W. Moyle Rogers in good quantity by Lyndhurst Road Station, whence I have seen a specimen.

Gloucester.—Mr. Jas. W. White, in his 'Flora of the Bristol Coal Field,' says:—"We have gathered by the river side under Cook's Folly the bramble mentioned by Mr. Briggs, under *R. Lindleianus*, in the 'Flora of Plymouth,' as very common about Plymouth, and probably an undescribed species" (p. 58). I have seen a specimen from this station.

Suffolk.—Polstead Marsh. Specimen collected Sept. 12th, 1889, by the Rev. E. F. Linton; seen thence.

Hereford.—Eaton Park Wood, Sep. 25th, 1888. Specimen in the collection of the Rev. Augustin Ley.

SYNOPSIS OF GENERA AND SPECIES OF *MALVEÆ*.

By EDMUND G. BAKER, F.L.S.

(Continued from p. 145.)

ALTHÆA.

** *Pterocarpæ* Boiss. Fl. Or. i. 831.—Carpelli dorsum canaliculatum marginibus in alas membranaceas expansis.

21. A. ROSEA Cav.; DC. Prod. i. 437; Rchb. Ic. Flor. Germ. v. t. 175; Bot. Mag. t. 3198. *Althæa caribæa* Sims in Bot. Mag. t. 1916. *A. coromandelina* Cav.; DC. Prod. i. 437. *A. chinensis* Wall. Cat. 2689. *A. cretica* Weinm. Syll. Ratisb. ii. p. 171. *A. flexuosa* Sims in Bot. Mag. t. 892. *A. meonantha* Link, Linn. ix. p. 586. *? A. mexicana* Kunze, Linn. xx. p. 51 et 404. *A. pulchra* Klotsch, Pr. Waldemar. Him. t. 26. *A. sinensis* Cav.; DC. Prod. i. 437. *Alcea rosea* L. Sp. 966.—Caule crasso erecto hirsuto, foliis longe petiolatis cordato-ovatis acute 5–7 lobatis, floribus 1–2 axillaribus, pedunculis brevissimis, bracteolis calyce paulo brevioribus tomentosis, sepalis tomentosis acutis, petalis magnis, carpellis rugosulis hirtis.

Hab. Crete! Greece! Peleponesus!

Stem 3–6 ft. high; leaves 2–4 in.; bracts $\frac{1}{2}$ in.; sepals $\frac{3}{4}$ in.; petals $1\frac{1}{2}$–2 in. long.

β. SIBTHORPII Boiss. Fl. Or. i. 832 = *Althæa ficifolia* Fl. Græc. t. 663, non L.—Foliis profundius palmatilobatis.

Hab. Crete.

In Bot. Mag. t. 3198, *A. rosea* is said to have been introduced into Europe from China in 1753.

22. A. PALLIDA Waldst. & Kit. K. Pl. Rar. Hung. t. 47. *Alcea pallida* Boiss. Fl. Or. i. 832.—Caule erecto crassiusculo, foliis tomentellis longe petiolatis suborbicularibus crenatis interdum lobatis, floribus 1–3 axillaribus, pedunculis brevibus, bracteolis calyce subæquentibus, sepalis tomentosis lanceolatis acutis, petalis roseis bilobis, carpellis rugosis ad medium dorsum et interdum facie hirtis.

Hab. South-east Germany. Greece! South Russia. Asia Minor!

Stem 2–5 ft. high; leaves 2–3 in.; bracts $\frac{1}{3}$–$\frac{1}{2}$ in.; sepals $\frac{2}{3}$ in.; petals $1\frac{1}{2}$–2 in. long. This plant may be distinguished from *A. rosea* Cav. by its smaller stature, somewhat differently shaped leaves, and narrower petals.

23. A. HELDREICHII Boiss. Diagn. Ser. 2, p. 103. *Alcea Heldreichii* Boiss. Fl. Or. i. 832. — Sparsim et adpressissime stellato-pilosa virens, caulibus tenuibus in racemis laxissimis inferne foliosis abeuntibus, foliis cordato-suborbiculatis obtusissime quinquelobis, bracteolis dimidio calyce triangularibus acutis, sepalis obtusiusculis, petalis roseis bilobis, carpellis facie et dorso rugosis dorso hirtis.

Hab. Korthiatia, near Thessalonica, *Heldreich.*

Differs from *A. pallida* W. K. in more adpressed indumentum, and smaller corolla and bracts.

24. A. CALVERTI Boiss. Diagn. Ser. 2, v. p. 66. *Alcea Calverti*

Boiss. Fl. Or. i. 832.—Tenuiter et adpresse cano tomentosa, caule tenui paucifloro, foliis minutis subcordato-orbiculatis obtusissime 5–7-lobis crenato-dentatis, pedunculis calyce æquilongis, bracteolis calyce dimidio brevioribus triangularibus acutis, calycis lobis acutiusculis, petalis roseis bilobis.

Hab. Erzeroum, Armenia, *Calvert.*

25. A. HOHENACKERI Boiss. et Huet. in Boiss. Diagn. Ser. 2, v. p. 67. *Alcea rosea* Ledeb. Fl. Ross, non L. *Alcea Hohenackeri* Boiss. Fl. Or. i. 833.—Caule adpresse canescenti-tomentello interdum ramoso, foliis longe petiolatis ovatis 5–7-lobatis, basi subcordatis bracteolis triangularibus vel lanceolatis dimidio calyce brevioribus, sepalis lanceolatis acutis, petalis retusis flavidis, carpellis undique pubescentibus.

Hab. Armenia! Persia! Afghanistan!

Stem 2–3 ft. high; leaves 1½–3 in.; bracts ¼ in.; sepals ½ in.; petals 1¼ in. long.

26. A. DENUDATA. *Alcea denudata* Boiss. Fl. Or. i. 833.—Caule præter pilis stellatis sparsissimis denudato in racemum densiusculum inferne foliosum abeunti, foliis breviter tormentellis virentibus ovatis inferioribus subcordatis obsolete trilobis acutis, pedunculis calyce brevioribus, bracteolis calyce triente brevioribus, petalis intense violaceis retusis carpellis facie et sulco dorsali hirtis alis valde dilatatis rugosissimis.

Hab. Hisan, near Bitlis, in Armenia.

27. A. NUDIFLORA Lindl. in Trans. Hort. Soc. vii. p. 251.—Caule erecto tomentoso, floribus 1–2 axillaribus, pedunculis brevibus, foliis cordato-rotundis 5-angulatis, bracteolis lanceolatis acutis dimidio calyce brevioribus, sepalis longe lanceolatis, petalis albis cuneatis emarginatis, carpellis angustis transverse rugosis.

Hab. Songoria!

Stem 3–6 ft. high; leaves 3 in.; bracts ½ in.; sepals nearly 1 in.; petals 1½–2 in. long.

28. A. FICIFOLIA Cav.; DC. Prod. i. 437. *Alcea froloviana* Fisch. *A. ficifolia* L. Hort. Cliff. 348. *A. rugosa* Alef. Oest. Bot. Zeit. 1862, p. 254. — Caule cano erecto minute pubescente, foliis viridibus magnis 3–5–7-palmatilobatis serratis fere glabris lobis oblongis obtusis dentatis, floribus axillaribus, pedunculis brevibus, bracteolis triangularibus dimidio calyce brevioribus, sepalis lanceolatis acutis, petalis sulphureis retusis, carpellis dorso hirsutis.

Hab. Altai Mts.! Russia! Armenia! Persia. Georgia! Egypt!

Stem 4–6 ft. high; leaves 3–5 in. long; bracts ¼ in.; sepals ⅔ in.; petals 1–2 in. long.

β. VIOLACEA Boiss. Fl. Or. i. 833.—Floribus violaceis.

Hab. Taurus. Khorassan.

γ. GLABRATA Boiss. Fl. Or. i. 834. *Alcea flavovirens* Boiss. et Buhse, Aufz. p. 44. *A. tabrisiana* Boiss. et Buhse, *l.c.* *A. glabrata* Alef. Oest. Bot. Zeit. 1862, p. 253. — Caule glabrato tenuiore ramoso, foliis minoribus glabratis lobatis.

Hab. Persia.

29. A. Tholozani. *Alcea Tholozani* Stapf. Bot. Polak Exp. p. 40. — Caule simplici vel parce ramosa tenue flexuoso inferne glabro superne griseo, petiolis longis, foliis viridibus inferioribus rotundato-cordatis interdum lobatis superioribus profunde fissis lobis angustioribus, floribus axillaribus in racemo aphyllo, bracteolis lanceolatis acutis, sepalis tomentosis, petalis albis, carpellis undique adpresse sericeo-pilosis.

Hab. Persia, *Pichler*!

Stem 1–2 ft.; leaves 2 in.; bracts ⅓ in.; sepals ⅔ in.; petals 1¼ in. long.

30. A. peduncularis. *Alcea peduncularis* Boiss. et Haussk. in Suppl. Fl. Or. p. 133.—Caule virgato glabro, foliis longe petiolatis parvis viridibus inferioribus cordatis superioribus ad vel ultra medium obtuse lobatis, floribus axillaribus solitariis remotis racemo aphyllo, bracteolis calyce dimidio brevioribus, sepalis lanceolatis acutis sublineatis tomentellis, petalis albis vel pallide roseis, carpellis tomentellis profunde canaliculatis margine in alas glabras latas obsolete reticulatas expansis.

Hab. Kurdistan, *Haussk.*! Persia, *Haussk.*!

Stem 1–2 ft.; leaves 2 in. long; bracts ⅓ in.; sepals ⅔ in.; petals 1½ in. long.

31. A. kurdica Schlecht. in Linn. xvii. p. 127. *Alcea kurdica* Boiss. Fl. Or. i. 834. — Caule tenui hirto, foliis inferioribus 5–7-palmatilobatis, pedunculis calyce brevioribus, bracteolis lanceolatis acutis calyce triplo brevioribus, sepalis lanceolatis, petalis violaceis, carpellis dorso late canaliculatis cano-tomentosis alis facie superiori non rugosis.

Hab. Mesopotamia. Kurdistan!

Stem 2–3 ft. high; leaves 3 in.; bracts ¼ in.; sepals ⅔ in.; petals 1½ in. long.

β. schirazana Boiss. Fl. Or. i. 834. *Alcea schirazana* Alef. Oest. Bot. Zeit. 1862, p. 252.—Bracteolis calyce dimidio brevioribus.

Hab. Persia!

32. A. arbelensis. *A. arbelensis* Boiss. et Haussk. in Suppl. Fl. Or. p. 132.—Caule crasso elato tomentoso griseo inferne folioso superne in racemum longum densiuscule multiflorum abeunti, foliis in laciniis late oblongo-linearibus denticulatis obtusis ultra medium partitis, pedunculis calyce brevioribus, bracteolis calyce dimidio brevioribus, corollis sulphureis, carpellis tomentosis non rugosis vix canaliculatis, ala angustissima non rugosa horizontali marginatis.

Hab. Arbela, Mesopotamia. *Haussknecht.*

Plantæ non satis notæ.

Althæa africana Lour.; DC. Prod. i. 437.
A. laxiflora DC. jun. ex Schlecht. Bot. Zeit. vi. 341.
A. speciosa Vis. l'Orto Bot. di Padova, p. 132.

Plantæ exclusæ.

A. Burchellii E. & Z. = *Pavonia mollis* E. Mey.
A. Borbonica DC. = *Pavonia* sp.?

V. LAVATERA L. Gen. n. 842.—Bracteolæ 3-6 basi connatæ. Fructus axis carpella æquans vel superans conica vel apice dilatata.

Sect. 1. *Anthema* Med. Malv. p. 42; DC. Prod. i. 439. — Axis parvus conicus, vix exsertus. Pedunculi axillares fasciculati raro solitarii.

1. Lavatera arborea L.; DC. Prod. i. 439; Rchb. Ic. Flor. Germ. v. t. 178; Fl. Græc. t. 665; Eng. Bot. 3, t. 279. *Anthema arborea* Presl. Fl. Sicul. i. p. 180. *Malva arborea* Webb. Phyt. Canar. i. p. 30. *Lavatera eriocalyx* Steud. in Flora, 1856, p. 438. *L. arborea* C. Gay, Fl. Chile, i. p. 288.—Fruticosa sæpe arborescens, foliis longe petiolatis molliter pubescentibus inferioribus cordato-orbicularibus lobatis superioribus 3–5-lobatis lobis acutis omnibus crenatis, bracteolis ovato-rotundatis post anthesin auctis, sepalis triangularibus acutis, corollis purpureis, carpellis 7–8 glabris vel pubescentibus dorso et faciebus transverse rugosis.

Hab. Great Britain! Western and Southern France! Portugal! Spain to Greece! North Africa! Canaries!

Stem 6–10 ft. high; lower leaves 3–4 in. long; peduncle 4–6 in.; bracts (flowering) ⅓ in.; sepals ⅓ in.; petals ⅔ in.

2. L. cretica L.; DC. Prod. i. 439; Jacq. Hort. Vindob. t. 41. *Malva mamillosa* Lloyd, Fl. W. France, ed. i. p. 90. *M. Wilkommiana* Scheele in Linnæa, xi. p. 570. *M. Pseudolavatera* Webb, Phyt. Canar. i. p. 29. *M. hederæfolia* Vis. Fl. Dalm. iii. p. 205. *Lavatera Empedoclis* Ucria in Roem. Arch. i. 69. *L. sylvestris* Brot. Fl. Lusit. i. p. 277. *L. neapolitana* Ten. Fl. Nap. 2. p. 113. *L. triloba* Seb. et Maur. Fl. Roman. p. 227, non L. *L. sicula* Tin. Sic. Pug. i. p. 14. — Caule herbaceo magis minusve hispido-scabro, foliis inferioribus longe petiolatis cordato-ovatis lobatis vel suborbicularibus membranaceis serratis, bracteolis oblongis obtusis parum accrescentibus, sepalis ovatis acuminatis, corollis violaceis, carpellis 10–12 glabris vel pubescentibus dorso rotundatis faciebus transverse rugosis.

Hab. Western France! Portugal and Spain! to Palestine and Syria! Canaries! North Africa!

Stem 1–5 ft.; leaves 2–3 in. long; petioles 3–6 in.; bracts ¼ in.; sepals ⅓ in.; petals ½ in.

Var. acutiloba Ball in Journ. Linn. Soc. xvi. p. 377.—Tota planta glabriuscula et statura paululum minore, foliis acute lobatis superioribus interdum subhastatis.

Hab. Marocco!

3. L. mauritanica Durieu, Rev. Duch. ii. p. 436; Expl. de l'Algerie, t. 69 non Desf. — Caule herbaceo, foliis inferioribus longe petiolatis cordato-orbicularibus lobatis molliter tomentosis serratis, bracteolis oblongis obtusis, sepalis ovatis acutis, petalis infra roseis, carpellis 9–10 dorso plano rugosis hirtis margine acute faciebus striatis.

Hab. Algeria!

Stem 2–4 ft.; leaves 1½–2½ in. long; petiole 3–4 in.; bracts (flowering) ¼ in.; sepals ⅓ in.; petals ½ in.

4. **L. microphylla**, n. sp. — Caule herbaceo ramoso decumbente, ramis lateralibus tenuibus, foliis parvis ovatis trilobatis serratis membranaceis parce stellato-hirsutis, stipulis parvis ovatis acutis, floribus in ramis lateralibus solitariis axillariis et terminalibus pedunculatis, bracteolis oblongis acutis pilosis ad imum connatis calyce brevioribus, sepalis ovatis acuminatis pilosis, petalis cuneatis purpureis leviter bilobis, axe fructus parvo vix exserto cum brachiis minimis radiantibus verticalibus, carpellis 7–8 dorso rotundatis glabris faciebus radiatim striatis.

Hab. Sherat River, 25 miles from Rabat, Marocco! *Abdul Grant.* Aug., 1887. Herb. Kew.

Stem 1 ft.; lateral branches 6–8 in. long; bracts $\frac{1}{4}$ in.; sepals $\frac{1}{3}$ in.; petals $\frac{1}{2}$–$\frac{3}{4}$ in.

Sect. 2. *Olbia* Med. Malv. p. 41. — Axis exsertus conicus vel hemisphæricus radiatim striatus. Pedunculi axillares solitarii raro aggregati.

**Americanæ.*

5. L. OCCIDENTALIS S. Watson in Proc. Amer. Acad. ii. 113 and 124.—Caule fruticoso, foliis longe petiolatis palmatilobatis serratis glabris, floribus axillaribus solitariis, bracteolis oblongis obtusis calyce brevioribus, sepalis triangularibus acutis accrescentibus, petalis anguste spathulatis stramineis violaceo-striatis, carpellis 6–10 puberulis dorso rotundatis margine acute.

Hab. Guadalupe Island, Lower California!

Stem 3–4 ft.; leaves 3–4 in. long; petioles 3–5 in.; bracts $\frac{2}{3}$ in.; sepals 1 in.; petals 2 in.

6. L. INSULARIS S. Watson in Proc. Amer. Acad. 12, 249.— Caule fruticoso, foliis longe petiolatis palmatilobatis glabris serratis, floribus axillaribus solitariis, bracteolis oblongis obtusis ad imum conjunctis calyce dimidio brevioribus, sepalis triangularibus acutis accrescentibus, petalis purpureo-flavidis, carpellis 9–10 puberulis dorso rotundatis margine acute.

Hab. Coronados Islands, Lower California!

Leaves 3–4 in. long; petioles 3–5 in.; bracts $\frac{1}{2}$ in.; sepals 1 in.; petals $1\frac{1}{2}$ in.

This plant differs from *L. occidentalis* in shape of the bracts and colour of the flowers.

** *Gerontogeæ.*

7. L. ACERIFOLIA Cav.; DC. Prod. i. 438. *Saviniona acerifolia* Webb, Phyt. Canar. i. p. 31, t. 1. B. — Caule fruticoso, foliis acute palmatilobatis glabris dentatis, floribus axillaribus solitariis, bracteolis lanceolato-ovatis usque ad medium coalitis, sepalis lanceolatis acutis, petalis violaceis aut pallide roseis, carpellis 12–15 dorso rugosis.

Hab. Canaries!

Stem 6–8 ft. high; leaves 2–3 in. long; bracts $\frac{1}{3}$ in.; sepals $\frac{2}{3}$ in.; petals 1–$1\frac{1}{4}$ in.

8. L. PHŒNICEA Vent.; DC. Prod. i. 438. *L. coccinea* Dietr. ex DC. Prod. i. 438. *Navæa phœnicea* Webb, Phyt. Canar. i. p. 34. t.

1 C.—Caule fruticoso, foliis acute palmatilobatis glabris dentatis, floribus axillaribus, pedunculis 3–5 floris, bracteolis ovatis obtusis calyce dimidio brevioribus, sepalis lanceolatis acutis reticulato-venosis, petalis ovato-lanceolatis, carpellis 30–40 glabris elongato-reniformibus.

Hab. Canaries!

Stem 12–15 ft. high; leaves 3–5 in. long; petiole 3–4½ in.; bracts ⅓ in.; sepals ⅔ in.; petals 1½ in.

9. L. Olbia L.; DC. Prod. i. 438; Rchb. Ic. Flor. Germ. v. t. 177; Bot. Mag. t. 2541. *Olbia hastata* Mœnch. Meth. 613. *L. acutifolia* Lam. Fl. Fr. iii. p. 137. *L. Pseudo-Olbia* Poir. Encyc. Suppl. iii, p. 309. *L. undulata* Desf. Arb. i. p. 471, non Mill. *L. thuringiaca* All. Ped. ii. p. 96, non L. — Fruticosa v. suffrutescens, foliis inferioribus cordatis 3–5-lobis superioribus lanceolatis serratis, floribus magnis remotis solitariis brevissime pedunculatis, bracteolis ovatis breviter acuminatis sepalis subæquentibus, petalis purpureis, carpellis tomentellis dorso planis margine obtuse.

Hab. West Mediterranean Region!

Stem 2–5 ft.; leaves 1–2 in.; petiole 1–1½ in. long; bracts ½ in.; sepals ½ in.; petals 1¼ in.

Var. hispida = *L. Olbia β. hispida* Gr. Godr. *L. hispida* Desf. Fl. Atl. ii. p. 118. *L. africana* Cav. *fide* Willd. *Olbia hispida* Presl. Fl. Sic. i. p. 179.—Pedunculis calycibusque pilis fasciculatis longis lanato-hirsutis.

Hab. West Mediterranean Region!

10. L. unguiculata Desf.; DC. Prod. i. 438. *L. Olbia* Smith, Prod. Fl. Græc. ii. p. 46, non L. — Caule fruticoso pube stellato tomentoso, foliis palmatilobatis lobo medio longiore superioribus trilobis, pedunculis brevibus, bracteolis ovatis mucronatis calyce subbreviore, sepalis triangularibus acutis, petalis violaceis emarginato-bilobis, carpellis hirtis margine obtuse.

Hab. Sicily! Crete! Cyprus! Greece! Samos!

Stem 2–5 ft.; leaves 2–3 in. long; bracts ¼ in.; sepals ⅓ in.; petals 1–1¼ in.

11. L. micans L.; DC. Prod. i. 439. *L. bryonifolia* Mill. Dict. n. 11.—Caule fruticoso, foliis inferioribus acute palmatilobatis lobo medio longiore tomentosis floribus subsessilibus, bracteolis ovatis acuminatis, sepalis ovatis acutis, petalis purpureis bilobis, carpellis dorso rotundatis superne hirtis.

Hab. Hispania!

Stem 2–4 ft.; leaves 2–4 in. long; bracts ⅓ in.; sepals ⅓ in.; petals 1 in.

12. L. punctata All.; DC. Prod. i. 439; Rchb. Ic. Flor. Germ. v. t. 176. *L. biennis* Guss. Fl. Sic. non M. B. — Caule herbaceo subscabro, foliis inferioribus reniformibus lobatis superioribus trilobis lobo medio longiore serratis, pedunculis longis solitariis folio longioribus, bracteolis calyce paulo brevioribus accrescentibus, sepalis triangularibus acutis, petalis cuneiformibus, carpellis glabris dorso rotundatis faciebus striatis.

Hab. Southern France! Italy! Corsica! Greece! To Syria and Palestine!

Stem 2–3 ft.; leaves 1–2 in. long; bracts ⅓ in.; sepals ½ in.; petals 1¼ in. (occasionally only ⅔ in.).

13. L. BIENNIS M. B.; DC. Prod. i. 439. — Caule herbaceo erecto, foliis inferioribus subrotundis lobatis superioribus ovatis trilobatis lobis lateralibus minimis, pedunculis folio longioribus, bracteolis ovatis mucronatis, sepalis triangularibus acuminatis, petalis truncato-retusis, carpellis glabris dorso rotundatis rugosis.

Hab. Armenia! East Caucasus.

Stem 1–3 ft.; leaves 1 in. long; bracts ⅓ in.; sepals ½ in.; petals ¾ in.

14. L. THURINGIACA L.; DC. Prod. i. 439; Rchb. Ic. Flor. Germ. v. t. 177. *L. olbia* Steph. Misc. 32, non L. *L. Thirkeana* C. Koch, Linn. xix. p. 58. *L. vitifolia* Wierzb. in Schur. Enum. Pl. Trans. 129.—Caule herbaceo tomentoso, foliis inferioribus palmatilobatis superioribus trilobis, pedunculis subsolitariis petiolo longioribus, bracteolis ovatis mucronatis calyce brevioribus, sepalis triangularibus acutis, petalis magnis pallide roseis, carpellis glabris dorso rotundatis angustis carinatis.

Hab. Scandinavia! Germany! Region of Danube!, to Asia Minor! Astrachan! and Siberia!

Stem 3–5 ft.; leaves 2–3 in. long; bracts ⅓ in.; sepals ½ in.; petals 1¼ in.

Var. AMBIGUA = *L. ambigua* DC. i. 440. *Malva Cyrilli* Vis. Fl. Dalm. iii. 207. *L. salvitellensis* Brig. *L. sylvestris* Ten. Prod. p. 40, non Brot.—Foliis inferioribus acute palmatilobatis medio longiore, floribus axillaribus et sæpe subumbellatis.

Hab. South France! Italy! Austria!

A specimen from Athenian peninsula (Aucher Eloy, 857 *bis*) has petals only ¾ in. long.

15. L. FLAVA Desf.; DC. Prod. i. 439. *L. agrigentina* Tin. Pug. p. 13. — Caule herbaceo tomentoso, foliis inferioribus subrotundis molliter tomentosis obsolete lobatis serratis vel crenatis, stipulis magnis ovatis acutis, floribus axillaribus aggregatis et in racemum terminalem, bracteolis molliter tomentosis magnis lanceolatis acutis, calyce paulo breviore, sepalis ovatis acutis, petalis flavidis, carpellis hirtis.

Hab. Sicily! Algeria!

Stem 3–4 ft.; leaves 1½ in. long; bracts ⅔ in.; sepals ¾ in.; petals 1 in.

(To be continued.)

PUCCINIA DIGRAPHIDIS.

By Henry T. Soppitt.

By a series of experimental cultures extending over the past twelve months, I have been enabled to demonstrate that the Æcidium of *Convallaria majalis* (*Æcidium Convallariæ*) is a heterœcismal Uredine, and that the host which bears the uredo and teleutospores is *Phalaris arundinacea*. Below is a condensed account of my observations.

On June 13th, 1889, I applied germinating spores of the Æcidium to the leaves of *Convallaria majalis*, *Molinia cærulea*, *Dactylis glomerata*, and *Phalaris arundinacea*. When infected the plants were in a healthy condition, and each plant was dealt with in precisely the same way and covered by a bell-glass.

The first indication of a result was on June 24th, 1889, when faint spots began to appear on the leaves of *Phalaris arundinacea*, from which developed, on June 29th, small reddish sori of uredospores. By July 4th several leaves were rusted over with uredo, and on July 17th the first black sorus of teleutospores was evident amongst the uredo. On Aug. 9th a great many of the black sori were conspicuous on the withering leaves.

Not the least result followed on the *Dactylis*, *Convallaria*, or *Molinia;* and I may also state that Mr. C. B. Plowright, of King's Lynn, infected *Phragmites communis* with spores of the æcidium I sent him, about the same time, but without result. With germinating uredospores—produced as above—I infected, on July 8th, two isolated plants of *Phalaris arundinacea;* both had developed uredo on July 24th, and on Aug. 11th the black sori of teleutospores began to show, which by Sept. 14th were numerous. During September I paid a visit to Bowness, Westmoreland,—a locality where the æcidium was abundant on *Convallaria* the previous spring,—and found no trace of uredo or teleutospores on *Phragmitis*, *Molinia*, or *Convalluria*, but *Phalaris arundinacea* was infested by a *Puccinia* with here and there uredo still evident, which on microscopical examination were very similar to those I had produced artificially, and in some respects not unlike the teleutospores of *Puccinia sessilis* and *P. phalaridis*, both species of which occur on *Phalaris arundinacea*.

A number of leaves containing the teleutospores were collected and placed under a bell-glass in a corner of my garden, where they remained undisturbed throughout the winter. Later on (Oct.), plants bearing artificially-produced teleutospores were similarly protected by a bell-glass and kept apart.

During December, 1889, and January, 1890, several attempts were made to cause the teleutospores to germinate, by placing a number of sori in water, and keeping them in a temperature from 60° F. to 70° F., but without success.

The first signs of germination were on April 23rd, when a short promycelium was seen emitting from two of the teleutospores. Three days later germination was more active, and at the end of April I commenced the following experiments, which had been carefully arranged beforehand:—

1. April 30th. — Actively germinating teleutospores from *Phalaris arundinacea* were applied to the leaves of *Convallaria* and *Allium ursinum*. On May 8th spermogonia were visible on *Convallaria*, which were succeeded by æcidium cups, many of the

spores from which were ripe and germinating on May 27th. No result followed on *Allium*.

2. May 5th. — With artificially produced teleutospores and promycelium-spores from *Phalaris*, which were in a state of germination, I infected *P. arundinacea*, *Convallaria*, *Allium*, *Arum maculatum*, *Polygonatum multiflorum*, and *Lilium bulbiferum*.

Spermogonia appeared on *Convallaria* on May 14th, and beyond slight yellowish spots appearing on *Polygonatum*, not the least result followed on *Phalaris*, *Allium*, *Arum*, or *Lilium*.

3. May 12th. — *Orchis mascula*, *Gagea lutea*, *Allium Scorodoprasum*, *A. ursinum*, *Scilla nutans*, *Polygonatum officinale*, *P. multiflorum*, *Arum maculatum*, *Convallaria majalis*, and *Phalaris arundinacea*, were infected with germinating teleutospores and promycelium-spores from Bowness, with the result that spermogonia were developed on *Convallaria* on May 20th, and were succeeded by æcidium cups on June 6th. No result ensued on *Allium*, *Arum*, or any of the other species.

4. May 22nd.—The last-mentioned experiment was repeated, additional plants of *Convallaria* being used, with the same results. Spermogonia were conspicuous by June 1st on *Convallaria*, but no result whatever on the other plants.

5. May 27th.—Germinating æcidiospores from *Convallaria* were applied to the leaves of other plants of the same species. No results.

6. May 31st.—*Phalaris arundinacea* was infected with artificially produced æcidiospores from *Convallaria majalis*. Result: on June 18th red spots of uredo were conspicuous on the leaves.

7.—Three plants of *Convallaria* from Bowness, infected by the æcidium, were planted on June 13th, 1889, and kept isolated. This year the plants are healthy, and up to the present time (June 19) are entirely free.

Mr. Plowright* has also produced the æcidium on *Convallaria*, at King's Lynn, from teleutospores on *Phalaris* from Bowness.

Puccinia digraphidis, n. sp.

1. (*Æcidium Convallariæ*).—Pseudoperidia mostly hypophyllous, seated on whitish or yellowish circular spots, circinating, or in small clusters, more elongated and irregular on the petiole, shortly cylindrical or nearly flat, margins white, torn. Spores sub-globose, epispore minutely verrucose, contents orange, 15–30 × 14–22 μ. On *Convallaria majalis*.

2. Sori on yellowish spots, small, reddish brown, subrotund or linear, sometimes confluent, scattered or collected in groups, erumpent. Spores subglobose or elliptical, epispore finely punctate, orange-red. 20–30 μ. in diameter. On *Phalaris arundinacea*.

3. Sori numerous, persistent, black, covered by epidermis, at first small, then linear, confluent, forming lines 1 to 3 mm. long on the leaves, longer on the sheaths. Spores brownish, smooth, very irregular, oblong, wedge-shaped, curved or elongate, apex of

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* Gard. Chron. May 24th, 1890, p 643.

upper cell thickened, rounded, truncate or obtuse, lower cell mostly attenuated, constriction slight. 42–52 × 19–22 μ. Pedicels very short or wanting. On *Phalaris arundinacea.*

Nearly allied to *P. sessilis*, but distinguished by its larger teleutospores and different life-history.

CHANGES AT KEW.

The retirement of Professor Oliver from official connection with the Kew Herbarium could not be allowed to pass without notice: and this was naturally felt more especially by those with whom he had been associated during his thirty years' connection with the Herbarium. It was therefore natural that they should have presented to him an address, embodying their feelings of attachment to the Professor and their appreciation of his work; and this presentation took place at the Kew Herbarium on Saturday, May 31st. Mr. J. R. Jackson, whose connection with Kew is of even longer duration, read the address, which was signed by the staff of the Herbarium and Museum, by representatives from the Gardens, and by one or two of the regular workers in the Herbarium.

Although no longer officially connected with the Herbarium, Prof. Oliver is not abandoning the scene of his labours; and his continued residence at Kew will enable him to attend periodically at the Herbarium, and to place at the disposal of the existing staff the encyclopædic knowledge which he possesses of the plants of the world. It is earnestly to be hoped that the time may be far distant when it will be necessary to place on record an estimate of Prof. Oliver's completed work. None but those who have had the privilege of being officially associated with him can fully realise the unceasing industry, unflagging zeal, and unselfish devotion which he has brought to bear upon his work; and it is no exaggeration to say that it is mainly owing to Professor Oliver that the Kew collection occupies the leading position which it takes among the herbaria of the world.

It was of course obvious that the position thus vacated could only be filled by one man, and that is our esteemed contributor Mr. J. G. Baker, who has been associated with Prof. Oliver since 1866. Mr. Baker has done more than anyone to bring together and systematise the scattered notices of the petaloid monocotyledones: his industry is indefatigable, and his knowledge extensive. The systematist and the horticulturist alike reckon Mr. Baker among their chief benefactors: his uniform kindness is known to all who have ever consulted him; and to this Journal he has been a constant and valued contributor literally from the first, for a paper from his pen appears in our first number, that dated Jan. 1st, 1864.

Mr. Baker's place as first assistant in the Herbarium is filled by Mr. Hemsley, whom we can also claim as an early and present contributor to our pages. As far back as 1863, Mr. Hemsley was associated with Mr. Bentham in the preparation of the 'Flora Australiensis,' and was referred to by the veteran botanist in the preface to that work as "a young but able assistant" in the Kew Herbarium. As is well known, a serious illness, which seemed at the time likely to disqualify him for further work, compelled Mr. Hemsley to resign his post in 1867; but, fortunately for science, the termination proved satisfactory, and Mr. Hemsley has steadily advanced in work and knowledge. It is only necessary to refer to the botanical portion of the 'Biologia Centrali-America,' to the Botany of the 'Challenger,' and to the important Flora of China, now in course of publication, to show that Mr. Hemsley is fully qualified for the post which he now occupies, and for which his work in the Kew Herbarium for a long period of years has completely fitted him.

That the three botanists—one in his honourable retirement, two in their new official positions—may long continue to pursue their career of distinguished usefulness is, we are sure, the sincere hope of all their fellow-workers, as it is that of the Editor of this Journal.

SHORT NOTES.

Rumex propinquus J. E. Aresch., in Britain.—In Dr. Trimen's 'Notes on some Scandinavian Plants' (Journ. Bot., 1872, p. 333), this plant is mentioned as likely to occur in the north of Britain. A form gathered by me in Shetland in 1888 has recently been determined as this hybrid, and it will doubtless be found in many places on the mainland of Britain, where *R. crispus* and *R. domesticus* grow together. The resemblance which the plant bears to *R. conspersus*, pointed out by Dr. Trimen, may cause the plant to be sometimes overlooked. Although I was unable to determine the plant with certainty myself, and it seemed to me to differ from *R. conspersus*, I have apparently distributed a few examples of it (No. 1027) under the latter name.—W. H. Beeby.

Pavonia hastata Cav.—A plant with the habits of *Abutilon* or *Hibiscus* was growing in my greenhouse, and I watched it for a long time, waiting to see its flowers expand; but at length the buds (as I believed them to be) turned yellow, so I opened them by force (the sepals being united together), and found they contained fully grown seeds. I then examined apparently young buds, and found they contained little crumpled flowers (not much larger than a pin's head), in which the styles were bent back upon the few monadelphous stamens, so that the stigmas were pressed against the anthers; seed was thus produced within the unopened petals and cohering sepals, which only open when the seeds are perfectly ripe. For some time the plant continued to produce such clandestine flowers. Then buds which could not be distinguished from them opened and developed large pretty flowers, of a light pink colour, and an inch and a half in diameter. In these large flowers the styles stood erect on a long monadelphous column, upon which were clustered a large number of anthers. These flowers also produced seed. I could not discover any difference in the fertility of the seed. Plants came up freely from those of both forms. When the large flowers appeared I easily made the plant out to be *P. hastata*, indigenous in Australia. So unlike are the two forms of flowers that this plant has not only been made into two species, but placed in distinct genera. Unlike other plants which produce clandestine flowers (generally I believe when they are exhausted at the end of the flowering season), *P. hastata* is first covered with the clandestine forms, and afterwards both are on the shrub together.—ROBERT T. FITZGERALD.

LEPIDIUM DRABA L., IN SOUTH WALES.—This plant was formerly very abundant about Swansea, on the ballast banks by the river side, a few hundred yards northward from the pottery, where I observed it in 1839. On visiting Swansea in the month of August, 1852, Mr. M. Moggridge and myself noticed it in several spots a little higher up the river, where it appeared perfectly naturalized. The natural range of the species extends over France to the English Channel. *L. ruderale* L., was observed occasionally on rubbish heaps about Neath and Swansea.—T. BRUGES FLOWER.

CAREX TOMENTOSA L., IN E. GLOSTER. — To-day, June 12th, I gathered the above Sedge, in the locality near Fairford, discovered recently by the Rev. R. H. Wilmot, which he was kind enough to conduct me to. This is by no means a water or even a wet meadow, but an ordinary pasture field on a slight eminence. The plant was scattered over the field, but was especially fond of the damper furrows. Associated with it were *Carex fulva* Good., *C. panicea*, L., *C. hirta* L., *C. flacca* Schreb., and probably inland *C. distans* L. Mr. Wilmot has also found it in two other localities, one of them a roadside in the vicinity; the latter locality being within two miles of the Oxfordshire boundary, in which county it will be doubtless found, now our attention is called to more suitable situations for search than water meadows. How its extirpation could have been referred to the drainage of the meadows I am unable to conjecture, since the plant flourishes well in the Oxford Garden in ordinary loam. The plate in E. B. gives little idea of the plant.—G. CLARIDGE DRUCE.

KENT PLANTS.—I have recently met with the following, which are not given in the second edition of 'Topographical Botany,' though some of them are very common, and must have been frequently noticed by previous observers. E. Kent (v. c. 15):—*Ranunculus trichophyllus* & *R. Drouetii*. Between Deal and Sandwich.—*Viola permixta*. Near Martin Mill.—*Cerastium tetrandrum*. Abundant near Queenboro', and between Deal and Sandwich—*Rubus rusticanus*. About Deal, Cranbrook, &c.—*R. cæsius* × *Idæus* (teste Babington). Ham Ponds.—*Myriophyllum alterniflorum*. Ham Ponds.—*Hieracium murorum*. Lanes N.E. of Hawkhurst.—*Gnaphalium uliginosum*, var. *pilulare* (teste Beeby). Dry soil, Chiddenden Woods, near Cranbrook.—*Salix aurita*. Chiddenden Wood.—*Festuca rubra*, var. *pruinosa* Hackel. Base of the cliffs, St. Margaret's

Bay. Mr. G. Dowker has also sent me *Carex chrysites* Link. (*C. Œderi* auct. plur.), from near Sandwich. W. Kent (v. c. 16):—*Viola permixta*. Woods on Morant's Court Hill.—*V. Reichenbachiana*. Woods near Shoreham, and near Chislehurst.—*Rubus rusticanus*. Dunton Green, Chislehurst, Cranbrook, &c.—*Epilobium obscurum*. About Cranbrook and Hawkhurst.—*Epipactis latifolia*. Woods near Shoreham.—EDWARD S. MARSHALL.

SCAPANIA PLANIFOLIA Hook.—Good specimens of this rare and fine species were collected last April in the neighbourhood of Borrowdale, Cumberland, by Dr. Carrington and myself. This is the first record for England. It was originally published by Dillenius, who received it from Snowdon (Dill. Hist. Musc. p. 493, n. 21, 1741), "Lichenastrum auriculatum Ornithopodii minoris pinnatis ciliatis." The late Prof. Lindberg, who had the opportunity of examining the Dillenian Herbarium, confirms the opinion that fig. 71, t. 21, represents *Scapania planifolia* (Lindb. Hep. Utvec. p. 34, 1877). Withering, in his 'Botanical Arrangement of all Vegetables growing in Great Britain,' vol. ii. p. 695, 1776, names it *Jungermannia ornithopodoides*, and Dr. Carrington says:—"If it were not that one held to the opinion that it is unwise to disturb a well-established name, one would not hesitate to reinstate Withering's specific name." Its distribution is somewhat singular; it is found on mountains in the South of Ireland and Scotland; no other station has been verified for it in Europe. The *Scapania planifolia* Hook. of Hüben. Hep. Germ. p. 228, described as being found in different parts of Germany, belongs to a form of *Scapania undulata speciosa* Nees (Syn. Hep. p. 66), or partly to *Scapania nemorosa* (Nees, Eur. Leb. 11, p. 434). Fine specimens of this species have been collected in the Sandwich Islands—Maui—open swampy ground, 6000 ft., D. D. Baldwin, 1875 ('Plantæ Hawaiienses,' n. 83), and Mr. Mitten records it from the East Indies (Proc. Journ. Linn. Soc. vol. v. 1861). These English specimens will be distributed in the forthcoming Fasciculus of 'Hepaticæ Britannicæ Exsiccatæ.'—W. H. PEARSON.

POTAMOGETON FALCATUS. — This species has grown during the present year under unusually favourable conditions, in water of sufficient and fairly uniform depth. Consequently I find a remarkable return of apparent varieties to the original typical form, which was first found growing in a deeper part of the ditch than the doubtful states of the species inhabited. Some of these states, only first noticed last autumn, I had felt inclined to refer to *P. heterophyllus*, and one or two seemed to approach *P. varians* very closely. But early in the present month I found all these forms, by growing in deeper water, had reverted to true *P. falcatus*. Many of the plants were just throwing up their flower-spikes, and I was more than ever struck with the resemblance this immature state of the species bore to plants of *P. nitens* then under cultivation in my garden. Anxious to obtain a further opinion on the specific value of my proposed segregate, I submitted living specimens to Mr. N. E. Brown, of Kew, who has most kindly sent me the following opinion :—"Having carefully examined it [*P. falcatus*] and compared it organ with organ, I quite fail to find any mark of distinction whereby it can be separated from *Potamogeton nitens;* it seems to me to agree precisely with that species."—N. E. Brown *in litt.* June 11th, 1890. *In this opinion I most thoroughly concur*, so far as the specimens sent are concerned. But Mr. Arthur Bennett, the Rev. T. Morong, and Dr. Fischer, agree with me that more mature specimens from the same rootstocks are distinct from the *P. nitens* of authors, and that they approach *P. heterophyllus* more closely than they do any other species. It therefore seems to me only fair to conclude that this form which, taken altogether, is neither good *nitens* nor good *heterophyllus*, will ultimately be found to be a species of average value in the group named *P. Proteus* by Chamisso and Schlechtendal.—ALFRED FRYER.

NOTICES OF BOOKS.

How to know Grasses by the Leaves. By A. N. MCALPINE, B. Sc. Edinburgh: D. Douglas. 8vo, pp. 92, 18 Plates. 3s. 6d. net.

THE desirability of being able to determine the constituent grasses of a pasture at any season of the year, and not only when the plants are in flower, is evident. The estimation of the feeding quality of the herbage by the relative number of flowering heads of different species is often misleading, and the only accurate way to judge the composition of a pasture is to separate each blade into its specific place. Some of our best feeding grasses, as *Dactylis glomerata*, have many more leaves relatively to their flowering stems than others, as *Lolium perenne;* it is, therefore, only by taking into consideration both the blade and the flowering stem, that we can arrive at a fair conclusion as to the pasture. Another cause of error in a determination made apart from the leaf-blades, is the different times of the year at which the grasses flower. If a field is examined in May, the flowers of *Cynosurus cristatus*, which generally matures in August, will be absent; though *Alopecurus pratensis*, the flowers of which will have disappeared in August, will be at its best. It being then necessary, from a practical agriculturist's point of view, to identify the blade at all seasons of the year, and not only the flowering stems of our grasses, a simple, and at the same time reliable, method of so doing will be welcomed by every student of agriculture.

But the task which Mr. McAlpine has set himself is not so easy as it may appear. The diversity in character of the leaves of grasses owing to the soil, climate, and other conditions, is considerable, and it is only by the microscopic examination of the structure of the blade that the position of some leaves can be determined. One of Mr. McAlpine's characters for identification of the leaf-blade consists in the colour at the base of the shoot, which in many cases is apparent on a cursory glance with the naked eye. Unfortunately this colouring is of so very variable a nature that it can hardly be accepted as a trustworthy test. The red colour at the base of the plants of *Lolium perenne* is often very striking, but it is not always present, and in some cases the colour approaches more to the shade which Mr. McAlpine attributes to *Alopecurus pratensis*. In this the colour is even less marked, and it is only after examining a large number of plants that the grey colour can be distinguished.

The identification of the grasses by the leaf-structure is, of course, much more satisfactory, but this needs too minute examination to be of much practical value to any but the scientific expert. For accurate determination one of the most important parts of the leaf is the ligule, which usually bears characteristic differences in each species; but to determine the constituents of a ten acre field, by examining the ligule of every plant, would be too great an undertaking even for a scientific farmer. Mr. McAlpine's woodcuts of the structure of our British grasses, with the exception of those from Stecker and Lund, are rather rough, and in some cases, especially in the sketches of the apices of blades, do not give much help in the work of identification. In the sketch of *Lolium perenne*, the ligule seems to be nearly absent, whereas it is usually from ½ to 1½ mm. in length. Mr. McAlpine must, however, be congratulated in being the first in this country to bring forward this difficult subject in a more or less practical form; and though the process of determining the different species is not so easy as it seems from reading Mr. McAlpine's book, yet his handbook will no doubt lead many to discover for themselves means of differentiating the constituents of our pastures at any season of the year.

J. B. Carruthers.

Articles in Journals.

Bot. Centralblatt (Nos. 21–25). — E. Bünger, 'Beiträge zur Anatomie der Laubmooskapsel.'—J. Röll, 'Ueber die Warnstorf'sche *Acutifolium*-gruppe der europäischen Torfmoose.' — (Nos. 21, 22). J. Boehm, 'Ueber Ursache der Wasserbewegung in transpirirenden Pflanzen.' — (No. 24). M. Kronfeld, 'Schaftblätter bei *Taraxacum officinale*.'

Botanical Gazette (May).—B. D. Halsted, 'Stamens of *Solanaceæ* (1 plate).—G. Vasey, 'A new grass' (*Rhachidospermum*, gen. nov., 1 plate).—W. J. Beal, 'Grasses in the wrong genus.'—J. N. Rose, 'Notes on *Perityle*' (1 plate). — 'An International Congress of Botanists.'—C. Macmillan, 'Relation of light to epinasty in *Solanum tuberosum*.' — O. Rodham, 'Netted septa in vessels of *Tecoma radicans*.'

Botaniska Notiser (häft. 3).—H. W. Arnell, 'Om några *Jungermannia ventricosa* Dicks. närstående lefvermossarter.'—J. Lindwall, 'Om några enskildes herbarier i norden 1772.' — R. Jungner, 'Ett fall af fasciation hos *Berberis vulgaris*.' — K. Starbäck, 'Några mykologiska notiser.' — A. G. Kellgren, 'Studier öfver Ombergsflorans papilionaceer.' — J. A. O. Skårman, '*Salix hastata* × *repens*, nov. hybr.' — R. Sernander, 'Några bidrag till den norrländska kalktuff-floran.'

Bot. Zeitung (Nos. 18, 19). — L. Jost, 'Die Erneuerungsweise von *Corydalis solida.*' — (Nos. 20, 21). Fr. Hildebrand, 'Einige Beiträge zur Pflanzenteratologie.' — (Nos, 22–24). J. W. C. Goethart, 'Beiträge zur Kenntniss des Malvaceen-Androecceums' (1 plate).

Bull. Torrey Bot. Club (May). — D. H. Campbell, 'Studies in Cell-division' (2 plates). — N. L. Britton, 'Naming of "Forms" in New Jersey Catalogue.'—D. C. Eaton, *Buxbaumia indusiata.*

Gardeners' Chronicle (May 31). — *Bulbophyllum lemniscatoides* Rolfe, n. sp. — *Abies bracteata* (fig. 112). — (June 7). *Lathyrus Sibthorpii*, Baker, *Zygopetalum Jorisianum* Rolfe, *Scaphosepalum antenniferum* Rolfe, spp. nn. — 'Tuberous branches' (fig. 116).— (June 14). C. T. Druery, 'Notes from Mexico.' — N. E. Brown, '*Catasetum Bungerothi*.'— 'The Theory of Heredity.' — (June 21). A. L. Kean, 'The Lily Disease.'—'*Disa tripetaloides*' (fig. 127).

Journal de Botanique (16 April).—Drake del Castillo, 'Flore du Tonkin' (*Cupuliferæ*—2 plates).— —. Hue, 'Lichens de Canisy.'— (May). B. Balansa, 'Graminées de l'Indo-Chine française' (*Brousemichea*, *Massia*, n. g.). — C. Sauvageau, 'Structure des feuilles des plantes aquatiques.' — P. Hariot, '*Trentepohlia*.' — N. Patouillard, 'Fragments mycologiques.'—(June). E. Bescherelle, 'Flore bryologique du Tonkin.' — H. Douliot, 'Développement de la tige des Conifères.'

La Nuova Notarisia (15 June). — G. B. De-Toni, 'Frammenti algologici.' — Id., Biography of Ferdinand Hanck (29 April 1845–21 Dec. 1889).—'Diagnoses Algarum novarum.'

Oesterr. Bot. Zeitschrift (June). — M. Willkomm, 'Neue und kritische Pflanzen der Spanisch-portugiesischen u. balearischen Flora.' — K. Bauer, 'Zur Phanerogamenflora der Bukowina.'— J. Freyn, 'Plantæ Karoanæ.' — R. R. v. Wettstein, *Sambucus Gantschii*, sp. n. (= *S. Ebulus* Hook. f. & Thoms., non L.). — J. Dörfler, 'Zur Gefässkryptogamenflora der Bukowina.'

LINNEAN SOCIETY OF LONDON.

May 24, 1890.—Anniversary Meeting. Mr. W. Carruthers, F.R.S., President, in the chair.—Messrs. W. West, J. B. Carruthers, and J. Sidney Turner were admitted Fellows.—The Treasurer presented his Annual Report, duly audited, and the Secretary having announced the elections and deaths of Fellows during the past year, the President proceeded to deliver his Annual Address, taking for his subject "The early history of some of the species of plants now constituting a portion of the Flora of England." He dealt in the first place with the researches of Mr. Clement Reid, whose discoveries in the glacial deposits now number 130 species. These, though doubtless only a portion of the plants which took possession of the island as its ice-covering disappeared, suffice to give us a general idea of the vegetation. Mr. Carruthers referred to the labours of H. C. Watson and E. Forbes in connection with the geographical distribution of our existing Flora, and cited the observations of Darwin, J. D. Hooker, and Hemsley, on insular Floras, with the more recent ones of Dr. Treub on the beginnings of vegetation at Krakatao, as showing that, in the case of new islands, whether of coral or volcanic origin, the first vegetation is borne by water and air-currents. Returning to our own island, Mr. Carruthers gave a sketch of its condition when the first members of our present Flora made their appearance. "The Tertiary Period had closed. Only in the immediately preceding Upper Cretaceous rocks had there been any association of species in a Flora analogous to the geographical groups of our own day. The plants that have been discovered in the Eocene beds possess the facies of a tropical Flora; the Miocene plants indicate a slight decrease in temperature, and this continues till we reach the subtropical Flora of the Pliocene. Then there appeared a remarkable change in the climate, and the Pliocene plants perished before the advancing boreal cold. The Pliocene plants do not belong to the same genera, seldom even to the same orders, as the Flora which follows; and they could not consequently have any ancestral relation to it. The cold that drove before it the subtropical vegetation was the forerunner of the ice age. Advancing in front of the ice, the first representatives of our existing Flora reached us from the north, where they had not however long established themselves, seeing that the tropical and subtropical floras of the Tertiary Period flourished far within the arctic circle. The remains of these earliest members of our present vegetation are buried in the Cromer Forest bed with the bones of the extinct mammoth, the rhinoceros, the hippopotamus, and the cave-bear, and of the still living horse, red-deer, beaver, mole, &c. Only in a single case has it been impossible to correlate what appear to be empty follicles with the corresponding parts of an existing plant; and it is possible these fruits may represent an extinct species, though the imperfect materials could not justify our asserting this without great reserve. Three of the species are no longer members of our existing Flora, though they still persist, like the beaver, in other lands."

Mr. Carruthers proceeded to enumerate and group geographically the 53 species of plants found in the Cromer beds, which, with two exceptions, *Salix polaris* and *Hypnum turgescens*, belong to the Germanic type of our Flora. Two of the Cromer plants, *Trapa natans* and *Pinus Abies*, have been lost to us, driven from our land before the advancing cold, and having failed to return when the ice retreated.

After further remarks on distribution, Mr. Carruthers concluded as follows:—

"Various estimates have been made of the centuries that have run their course since the glacial epoch. Beyond the date at which man began to record time we can have no definite information. We can trace the succession of events, but the statements of the time required to bring about these events are based on deductions from the accompanying or resultant physical or biological phenomena, and must differ according to the estimate of the various observers. So all the interval between our own day and the glacial epoch is, as we express time, very great, though small relatively to the history of the globe. It must, however, be admitted to represent an appreciable fraction of the time that has elapsed since we meet with the first record of dicotyledonous plants in the earth's strata. As we have seen, the species constituting the British Flora then possessed all the characters which are now used to distinguish them as independent species. For instance, the somewhat minute peculiarities which separate *Salix herbacea* from *S. polaris* were present in the plants which grew in glacial times in Britain, and they have not been added to or even intensified in the living plants of the two species, although the changed physical environment has driven the one north, within the arctic circle, and the other to the tops of the higher mountains. And what is true of these two Willows is true of all the other plants which have hitherto been discovered in the glacial beds. The mosses and ferns, the gymnosperms and angiosperms, exhibit the same characters, without addition or modification, as their living descendants."

On a ballot taking place for new members of Council, the following were declared to be elected:— Dr. P. H. Carpenter, Dr. J. W. Meiklejohn, Mr. E. B. Poulton, Dr. D. Sharp, and Prof. C. Stewart. On a ballot taking place for President and officers, the following were declared to be elected:— President, Prof. Charles Stewart; Secretaries, B. D. Jackson and W. P. Sladen; Treasurer, Frank Crisp. — The Linnean Society's Gold Medal for the year 1890 was then formally awarded and presented to Professor Huxley for his researches in Zoology.

June 5. — Prof. Charles Stewart, President, in the chair.— Messrs. Harvey Gibson and W. F. Kirby were admitted and Messrs. W. H. Beeby and S. Gasking were elected Fellows of the Society. —The President then nominated as Vice-Presidents for the year Messrs. W. Carruthers, P. Martin Duncan, J. G. Baker, and F. Crisp. — Mr. H. Little exhibited and made some remarks upon a remarkable Aroid, *Amorphophallus titanum*, which had flowered for the first time in this country. — Mr. James Groves exhibited a specimen of an *Orobanche* parasitic upon a *Pelargonium*. — The following papers were then read and discussed:—Mr. G. F. Scott Elliot, "On a collection of plants made by him in Madagascar"; Rev. G. Henslow, "On Weismann's Theory of Heredity applied to plants"; Mr. Harvey Gibson, "On the development of the tetrasporangia in *Rhabdocorton Rothii*, Naegeli"; "On the position of *Chantransia*, with a description of a new species, by Mr. George Murray and Miss E. Barton"; Miss A. L. Smith, "On the development of the cystocarp in *Callophyllis laciniata*"; and Mr. J. B. Carruthers, "On the cystocarps of some genera of Florideæ."

NOTES ON PONDWEEDS.

By Alfred Fryer.

Potamogeton crispus L. — Rootstock terete, slender, creeping, shallow-rooting; *stem compressed*, obscurely quadrangular, guttered on the flattened sides, rounded on the edges; simple below, branched above, and with short branchlets springing from the axil of each leaf on the main stem. Leaves all similar, strap-shaped, oblong, alternate, or sometimes opposite at the base of the branches and in the upper part of the stem, rounded and semi-amplexicaul, or slightly narrowed and sessile at the base; *strongly undulated, crisped, serrulate*, blunt, or narrowed towards the apex, without a distinct mucro, flat and very finely serrulate on young submerged growths; with three prominent ribs, upper with two fainter ribs near the margin connected by distant oblique veins; brownish green, tinged with red or purple or bright green, translucent, shining, somewhat horny. Stipules small, very short, lacerated at the apex, scarious, not persistent. *Peduncles* slightly curved, springing from the forks of the branches, or lateral, rarely subtended by opposite leaves, *compressed like the stem*, but not channelled except in the slightly tapering upper part; as long as or longer than the subtending foliage. Spike short, few-flowered. *Drupelets* (fresh) *acuminate, with a long beak* equalling or exceeding the nut; *central keel slightly winged and crested, with a conspicuous fleshy tooth at the base* almost parallel with the axis of the fruit, lateral ridges obscure, blunt. Whole plant submerged except the spikes, which are sustained for some time above the water even when in fruit.

P. crispus is easily distinguished from all hitherto described British pondweeds by its compressed stem, and by its remarkably long-beaked fleshy fruit; also, in the ordinary state, by its strongly undulated crisped leaves. It is rarely, however, that the leaves are so conspicuously curled as in the specimen represented in 'English Botany' (ed. 3, pl. 1413); I have only once collected this extreme state.

The plant begins to grow in late autumn, and continues growing throughout the winter; the young shoots, especially on the deeply submerged barren branches, have flat and narrow leaves, which have much the appearance of those of *P. obtusifolius* or of *P. Friesii*, but may be known from those of all the species of "*graminifolii*" by their finely serrulate but not *flattened* margins, and the branches by their *compressed* stems. Authors generally consider that Hudson's *P. serratus* (*P. crispus* var. *serratus* Lond. Cat. ed. 8) was founded on this young state of *P. crispus;* perhaps, however, it would be better to restrict the name of *P. serratus* to a small flat-leaved form of the species which is distinguished by its finely serrulate *flat*, narrow, strap-shaped leaves even when the plant is in fruit. Possibly this form may be a true variety of *crispus;* but, as far as I have been able to observe it in the Fens, where in some districts it is common, it is more probably a *state* induced by local conditions. It is usually found in ditches crowded with vegetation, and when shoots from the same rootstock are able to struggle into an un-occupied space on the surface of the water, the leaves become crisped and undulated to some extent; but further observations are needed to decide the question of state or variety. In relation to this question it may be explained that Pondweeds have two usual modes of defence against competing vegetation: one is by producing narrow grass-like leaves which can exist in a crowd, the other by developing broad coriaceous floating leaves, which, involute in vernation, are enabled to pierce through the dense surface growths, and then, expanding, are able to smother such plants as are incapable of rising above the surface of the water. In the first mode they imitate *P. pectinatus*, in the second *P. natans*, the two extremes of the genus in most arrangements. In another respect, too, *P. crispus* has some resemblance (or perhaps some reversion) to the *pectinatus*-group, that is, in early growths, made from November to January; many of the lower leaves are *adnate*, being sessile on the backs of the stipules. These adnate leaves are flat and narrow, but in other respects resemble the ordinary leaves of the species, and are of common though not universal occurrence; as many as two to six are to be met with on the main stem, and from one to three on the branches. Like the stipules they are very fugitive, and therefore cannot be found on the more mature growths. Although most frequent in the winter, they are occasionally produced throughout the year, especially on the young branchlets springing from the axils of the lower leaves. These adnate lower leaves have already been noticed in *P. Friesii*, *P. perfoliatus*, *P. prælongus*, *P. Griffithii*, *P. decipiens*, *P. Zizii*, *P. coriaceus*, *P. heterophyllus*, *P. nitens*, *P. rufescens*, *P. plantagineus*, and *P. fluitans*. Probably they will be found to occur in all the other British species; they should be looked for when the plants are growing under adverse conditions; forms which are probable hybrids seem especially liable to produce them.

I would also call attention to the remarkable fact of the fruit-spikes being borne above the surface of the water. As a rule, the fruits of *Potamogeton* seem to be matured under water, in some species even after the decay of the stems in autumn; full observations on this point are much needed, and require to be made year after year, as there are some indications that the season and manner of ripening the fruit is not constant in the same species.* Chamisso and Schlechtendal ('Linnea,' v. 2, p. 187) remark that the fruits are often abortive; this species, however, possesses a peculiar way of propagation by means of thyrsiform winter-buds, which form in the axils of the leaves, and which are produced in such numbers as to render the plant able to diffuse itself through a large sheet of water in less time than any other species can do by seed. These winter-buds are horny in texture, and have probably greatly aided the dispersion of *P. crispus* over the greater part of the world.

There is no species of *Potamogeton* which will better reward careful investigation; easily recognised by the beginner, there is no danger of confusing it with any other species, and, as it is in active growth throughout the year, it affords matter for almost daily observation. Perhaps no botanist, however skilful, can grasp the idea of a "species" in the genus *Potamogeton* who has not watched the growth of some one form throughout one year at least. At the end of that time he will have been able to observe enough of the wonderful changes these plants undergo to enable him to correct to some extent the false conclusions to which such dried specimens as are usually found in herbariums would otherwise infallibly lead him.

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* Probably the fruit of *P. crispus* is matured under water, but it seems to be less deeply submerged than that of most species, and liable to frequent exposure to the air, a condition which the thick corky drupelets can sustain without injury.

P. crispus is abundant throughout all the Fen-land water, and is probably to be met with in every county in Great Britain.

NOTES ON OXFORD PLANTS.

By G. Claridge Druce, M.A., F.L.S.

Four years having elapsed since the publication of the Oxfordshire Flora, it may be well now to place upon record some of the additions which have been made.

For the Ouse district, which had been imperfectly explored, Mrs. Worley sent a list of plants noticed by her about Hethe, which included some interesting species. Two of them, *Genista anglica* and *Vaccinium Myrtillus*, I have hitherto not been fortunate enough to meet with in the county. They are exceedingly rare in the locality where they were noticed by Mrs. Worley, relics probably of an ericetal vegetation now almost destroyed.

The species additional to the county are marked *. The numbers following the localities denote the divisions, as defined in the 'Flora.'

Adonis autumnalis L. Colonist. Cottesford, Mrs. Worley, 2.

Ranunculus acris L., var. *multifidus* DC. Chinnor 7. — *R. Flammula* L. Cottesford, Mrs. Worley, 2. — Var. *latifolius* Wallr. Headington Wick, 4.—Var. *ovatus* DC. Pond near Nettlebed, 7.—*R. heterophyllus* Web. Pond near Witney, 5.

Helleborus viridis L. Our plant appears to be the *H. occidentalis* Reuter, the glabrous form of aggregate *H. viridis* L., but which, perhaps, may be better described as var. *occidentalis* (Reut.).

Delphinium Ajacis Reich. Bayswater, Rev. F. Woods. Plentiful in a field near Summertown, 4.

Nigella damascena L. Casual. Corn-fields near Hethe, Mrs. Worley, 2.

Nymphæa alba L. Was first recorded as an Oxford plant in Lobel, 1576.

Papaver Rhæas L.—Var. *Pryorii* mihi is not infrequent on sandy soils as at Headington, 4; Radley, 6; Ipsden, Goring, and Barton, 7. A plant with decumbent stem and pale flowers is probably the var. *Roubiaei* Vig. It occurred on waste ground near the gasworks, Oxford, 5.

**Fumaria pallidiflora* Jord. Appeared as a casual on some rubbish-heaps near the gas-works in 1886.

Nasturtium amphibium Br.—Var. *variæfolium* DC. Osney, 5.—Var. *indivisum* DC. South Stoke, 7.

Cardamine hirsuta L., var. *multicaulis* Hoppe. Near Upper Heyford, 4.

Sisymbrium Sophia L. Once not infrequent in the county; I met with it for the first time on rubbish-heaps near Portmeadow, 5, in 1889. A MS. note in a copy of Lyte's 'Herbal,' recently acquired by the Bodleian, gives "it as upon olde walls about Oxford everywheare." This herbal contains some valuable notes on Oxford plants. They were made evidently by a Fellow of Magdalen College, since he alludes to *oure* cloister and *our* grove, while he calls New College by its name. There is no other college, I believe, which possesses both a cloister and grove. The writer had visited Italy, for he alludes to plants gathered there. It is very probable that they were written by Wm. Browne, joint author with the elder Bobart of the first catalogue of the Oxford garden plants.

Brassica Sinapis Vis. Both varieties, i. e., *orientalis* Gaud. and *leiocarpa* occur.

Lychnis Githago Scop. Cottesford, Mrs. Worley, 2.

Silene anglica L. Still occurs about Headington Wick, 4.

Cerastium semidecandrum L., var. *glandulosum* Koch. Near Stow Wood, 4.

Arenaria tenuifolia L. Cemetery-wall, Osney, 1866, 5. An interesting case of persistence. Sibthorp recorded it as growing on the walls of Rewley Abbey. This has long since been demolished, but the plant still, as the above record shows, continues in the vicinity. It is a local and rather rare plant in the county. South Stoke, on village wall, 7.

Sagina ciliata Fries. Kingham, 5.

**Linum angustifolium* Huds. At Cottesford, among dead grass, one year only, Mrs. Worley, 2. ? Casual.

Hypericum Elodes L. Mr. Boswell believes Mr. Fox must have made an error when he recorded this for Headington Wick in 1857. It certainly has not since been seen.

Acer campestre L. The var. *hebecarpum* DC. appears to be the common plant.

G. columbinum L. I find, from Bobart's herbarium, that his record referred, in the 'Flora of Oxford,' to this plant, really belongs to *G. dissectum* L.

Oxalis Acetosella L. Shelswell, Mrs. Worley, 2.—Var. *lilacina* Reichb. Stokenchurch Wood, 7. Leighton says the var. *purpurea* retains its colour in cultivation.

Cytisus scoparius Link. Shelswell Wood, Mrs. Worley, 2. I cannot follow Mr. Daydon Jackson in his statement that "the genus *Genista*, as defined by Bentham and Hooker, includes *Sarothamnus* Wimm."

Genista anglica L. Hardwick Heath, Mrs. Worley, 1884, 2.—*G. tinctoria* L. Checkendon, Rev. C. Abbey, 7.

Medicago lupulina L., var. *scabra* Gray. Iffley, 6. This form, which has glandular hairs on the fruit, appears to be rather scarce.

Melilotus officinalis Lamk. Crowell, Goring, 7.—*M. indica* All. Shotover brick-yard, 6. Only a casual. — **M. arvensis* Wallr. On rubbish-heaps near Portmeadow, 1889.

Trifolium pratense L. Miller's *T. sativum* was reduced by Afzelius, in 1790, to a variety, who must therefore be quoted as the author, not Syme. — *T. incarnatum* L.; the var. *stramineum* Presl occurred with the type at Bensington, 6.—*T. filiforme* L. Hardwick Heath, 1888, 2.

Lotus tenuis Kit. Bullingdon Bog, 1889, 6.

Lathyrus sylvestris L. Abundant on some quarries near Kirtlington Station, 4. — *L. pratensis* L. The hairy form, var. *villosus* Schleich., also occurs near Oxford, &c.—*L. Aphaca* L. Appeared as a casual in North Oxford, L. Lester, 5.

Vicia lathyroides L. Lower Goring Road, Rev. C. Abbey, 7.

Prunus avium L. Cottesford, 2.

Rubus rosaceus Bluff et Fing. Allbury, 6.—*R. suberectus* Anders. A name clearly antedated by that of *R. nessensis* Hall. The Shotover plant is not this species, which is still lacking for Oxon.—**R. affinis* W. et N., var. *cordifolius* Bab. Headington Wick, 4; Shotover, 6. —*R. macrophyllus* Weihe, var. *glabratus* Bab. Shotover, 6. — **R. Bellardi* Weihe. Sherburn Wood, 7.

Fragaria elatior Ehrh. This name is antedated by that of *F. magna* in Thuillier's Fl. Par., 1790.

Potentilla fragarioides Vill. 1789, appear to be earlier than *P. Fragariastrum* Ehrh.—*P. Anserina* L., var. *glabrata* Sond. Portmeadow, 1889, 5. An interesting variety with small green leaves. The var. *sericea* Koch is our common plant.—*P. argentea* L. In a little gravel-pit on east side of wood beyond Chazey Farm, 1885, W. Holland!, 7. One of our rarest species.

Rosa tomentosa Sm., var. *sylvestris* (Lindl.). In hedges in Oxfordshire, Lindl. Brit. Flora, 101; Horsepath Lane, 6. — *R. rubiginosa* L. Cottesford, Mrs. Worley; Hardwick Heath, 2. — *R. micrantha* Sm. Headington Wick, Beckley, 1886, 4. — *R. sepium* Thuill. Beckley, Rev. W. Moyle Rogers, 4. An interesting rediscovery.—*R. canina* L., var. *frondosa* (Stev.). Merton, Rev. W. Moyle Rogers; Marston, 4; Horsepath, 6. — Var. *Kosinciana* (Bess). Fencott, Merton, &c., Rev. W. Moyle Rogers, 4. — Var. *decipiens* (Dumort.). Shotover, 6. — Var. *Watsoni* Baker. Shotover, 6. I owe many thanks to M. Crépin for naming the *Rosæ*.

Cratægus oxyacantha L., var. *laciniata* Stev. Not infrequent.

Epilobium hirsutum L., f. *virescens* Haussk. Headington Wick, 4. — Var. *subglabrum* Koch, f. *albiflora*, see Plot's Hist. Oxon. — *E. parviflorum* Schreb., f. *umbrosa*. Marston, 4. — *E. parviflorum* × *roseum* = *E. persicinum* Reichb. Mixbury, 2; Marston, 4; Bullingdon, 6. — *E. montanum* L., f. *umbrosa*. S. Peter's Churchyard, Oxford.—f. *grandiflora*, Cowley, 6. — *E. montanum* × *parviflorum*. Kingham, 5; Shotover, 6.—*E. roseum* Schreb., var. *simplex* Morris. Garden-ground, Oxford.—f. *umbrosa*. Oxford.—*E. tetragonum* L. pp. = *E. adnatum* Griseb. Rycote, Albury, 6. — *E. obscurum* Schreb.,

f. *aprica* Bruern, 5.—f. *annua*. Headington, 6.—*E. palustre* L., var. *lineare* Kraus. Headington, 1886, 4.—f. *ramosa*. Otmoor, Oxon, 4.

Hippuris vulgaris L.—A submerged state, the var. *fluviatilis* Roth also occurs; it is Bauhin's *Equisetum palustre, Linariæ scopariæ folio*.

Æthusa Cynapium L., var. *agrestis* Wallr. Not infrequent in stubble-fields about Oxford.

Anthriscus vulgaris Pers. Charlton, Rogers, 4; Minster Lovell, on the ruins, 5; Dr. Ayres in Hb. Baxter, 6.

Scandix Pecten veneris L. The primary leaves are linear, much resembling those of *Myosurus*.

Cicuta virosa L. Mr. Fox was mistaken in thinking he had seen it between Bicester and Middleton; I greatly doubt if the plant has ever been found in the county.

Pimpinella major Huds., var. *rubens* Fleisch et Sind. Marston, 4.

Petroselinum segetum Koch. Bicester, 4; Cowley Road, 6; Aston Rowant, 7.

Galium saxatile L. Hardwick Heath, 2.

Valerianella carinata Lois. Chiselhampton, 6.—*V. rimosa* Bast. Near Goring, 7.

Scabiosa arvensis L., var. *pinnatifida* Gray, var. *integrifolia* Gray.

Bidens cernua L. Marston, 1886, H. E. Garnsey!, 4.—*B. tripartita* L., var. *integra* C. Koch. Marston.

Senecio Jacobæa L., var. *flosculosus* Gray. Kirtlington, 4.—*S. vernalis* W. et K., so named by Dr. Boswell, is not the plant of Waldst. et Kit, but a form or hybrid of *S. squalidus*. Our plant has glabrous stem and leaves. The true plant is decidedly hairy.

Chrysanthemum segetum L. Hethe, Rev. T. Martyn, 2.

Gnaphalium uliginosum L., var. *G. pilulare* Wahl. After examining many thousands of specimens I at last met with the above plant in a damp sandy field near Headington Wick, where several plants occurred amidst a profusion of the ordinary form. I suppose we should write it var. *lasiocarpum* Ledeb.; see Fl. Ross, p. 609, vol. ii, "acheniis hispidulis."—*G. dioicum* L. Watlington Hill!, Miss Smith, 1887, 7. A second locality for this very rare Oxford plant, if, indeed, it still exist, on Woodcote Heath—Sibthorp's locality—where I have sought in vain for it. In the above locality it is limited to a few yards in extent, and is on the chalk escarpment of the Chilterns, which I suggested was a likely place for it.

Filago spathulata Presl. Headington, 6; near Stow Wood, 4. This will probably have to be referred to *F. pyramidata* Vill.—*F. minima* Fr. Fields near Stow Wood, 4.

Solidago Virgaurea L. Checkendon, Rev. C. Abbey, 7. A third Oxon station.

Pulicaria dysenterica Gaertn, var. *longiradiata* mihi. Islip, &c.

Cnicus arvensis Hoffm., var. *setosus* (Bess). River-side, Oxford, F. T. Richards!, 5, 1888.—Var. *horridus* (Wimm. et Grab.). Common.—Var. *mitis* Koch. Marston, &c.

Centaurea Cyanus L. Cottesford, Mrs. Worley, 2. — *C. solstitialis* L. Ardley and Chesterton, Rev. W. H. Draper, 4.

Campanula Trachelium L. Our plant has the calyx hispid = the *C. urticifolia* of Schmidt and var. *dasycarpa* Koch. A pedunculate form occurred at Headington Wick.

Jasione montana L. Headington Wick, W. Patey. Bayswater; abundant, 4.

Erica cinerea L. Beckley, W. Moyle Rogers, 4.

Vaccinium Myrtillus L. A small piece on Cottesford Home Plantation, Mrs. Worley, 2; wood near Heath End, Rev. C. Abbey (perhaps Sibthorp's locality), 7.

Hypopitys Monotropa Crantz. Coomb Wood, Rev. A. East, 6; Kingston Wood, Mrs. Somervell, 7.

Pyrola minor L. In Hb. Morison the sheet of *Pyrola rotundifolia* contains two specimens of *P. minor*, which may be the Oxford specimens gathered by Bobart.

Gentiana germanica Willd. Wormsley, Mrs. Coker Beck, 7. *G. critica ?* Ehrh. is an older name.

Limnanthemum peltatum Gmel. Cherwell, 4.

Menyanthes trifoliata L. Cottesford, Shelswell, 4; Wootton, 5.

Cuscuta Trifolii Bab. Hethe, Rev. T. Martyn, 2.

Lycopsis arvensis L. Shelswell, Mrs. Worley, 2.

Echium vulgare L. Cottesford, Mrs. Worley, 2.

Myosotis versicolor Roth., var. *M. Balbisiana* Jord. Shotover, 6.

Cynoglossum officinale L. Thame Road, near the 'Three Pigeons,' 6.

Omphalodes verna Moench. Naturalised in stone-pit near Sarsden, 5.

Hyoscyamus niger. Cottesford, Mrs. Worley, 2.

Solanum nigrum L., var. *miniatum* (Bernh.). Garden-ground, Crowell, Mrs. Coker Beck !, 7.—var. *luteo-virescens* (Gmel.). Oxford; waste ground, 5.

Verbascum Thapsus L. Cottesford, Mrs. Worley; Hethe, Rev. T. Martyn, 2; Islip, Rev. Moyle Rogers; Bayswater, 4.— *V. virgatum* Stokes in With. ii. 1, 227. Islip, an escape, Rev. W. Moyle Rogers, 4. Usually attributed to Withering, but Stokes is the real authority.

Linaria repens Mill., var. *grandiflora* Godr. Near Wallingford, 7.

Veronica didyma Tenore, Fl. Neapol. Prod. v. 1811. Appears to antedate the name of *V. polita* Fries, Nov. Ed. i. 1814, *teste* Mottini in Ann. Sc. Nat. 1834, p. 119. — *V. Tournefortii* Gmel. 1805 = *V. persica* Poir. 1808. Was first recorded as an Oxford plant by Mr. Borrer in E. B. 2769, 1832.

Euphrasia officinalis L., var. *nemorosa* (H. Mart.). Portmeadow, 5; Binfield, 7, *teste* F. Townsend.

Veronica arvensis L., var. *perpusilla* Bromf. Ipsden, 7.

Galeopsis speciosa Mill. Hethe, once only, Mrs. Worley, 2.

Stachys arvensis L. Cottesford, Mrs. Worley, 2.

Marrubium vulgare L. Cottesford, Mrs. Worley, 2. Near Folly Bridge.—Var. *apulum* DC. Botley, 1888, 5.

Mentha cardiaca Sm. Shotover, 6.—*M. arvensis* L. = *M. Hosti*

Bor. Noke, 4.—*M. hirsuta* L., var. *pedunculata* Pers. Marston, 4. —*M. sativa* L., var. *crenata* (Beck). Portmeadow, 5.—Var. *Beneschiana* (Opitz). Bruerne, 5; Caversham, 7.

Chenopodium rubrum L., var. *pseudo-botryodes* Wats., Noke, Rev. W. Moyle Rogers, 4; Foxcote, 5.—*C. urbicum* L. Near gas-works, 1886, var. *intermedium* Bor., 5.—*C. murale* L. Abundant on waste ground near Portmeadow, and by canal-side, 1889, 5. Pointed out to me in the latter locality by Mr. Richards.

Rumex maritimus L. Ditch near the gas-works, 1888; abundant on waste ground near Portmeadow, 1889, 5.

Polygonum mite Schranck, var. *angustifolia* Braun. Marston; with the form *umbrosa* Sôelan, 4.

Daphne Laureola L. Shelswell, Mrs. Worley, 2.

Mercurialis annua L. Garden-ground at Oxford, very rare, 1889.

Urtica dioica L., var. *atrovirens* Gren. et Godr. Marston.—Var. *microphylla* Haussm. Oxford. See 'Report of Record Club, 1888.' —f. *glabra* Hartm. Stanton Harcourt.

Salix viridis Fries. Cottesford, 2.

Potamogeton compressus L., Spec. Pl. ed. i. et Fl. Suec.=*P. zosteræfolius* Schum. South Stoke, 7.

Epipactis latifolia All. Stokenchurch, 7. The type-plant.

Spiranthes autumnalis Rich. Hardwick Park, Wm. Holland!, 7.

Orchis latifolia L. Cottesford, Mrs. Worley!, 2.—*O. incarnata* L. Garsington, Rev. J. Bell!, 5.—*O. pyramidalis* L. Holton Quarries, 6.

Habenaria chloroleuca Ridley. Cottesford, Mrs. Worley, 2.

Ophrys apifera Huds. Cottesford, Mrs. Worley, 2.

**Polygonatum multiflorum* All. Probably native in Shierburn Woods, 7.

Paris quadrifolia L. Coomb Wood, Rev. A. East, 6.

Lilium Martagon L. Quite naturalised in Mrs. Pochin's park at Chiselhampton with *Tulipa sylvestris.*

Gagea fascicularis Salisb. Near Banbury, Mr. Rendall, 3; Middleton Stoney, F. R. Wilson, 1887, 4.

Muscari comosum Mill. One or two plants in a corn-field at Bullingdon Green, Miss Hodgson, 1888!, 6. How introduced?

Colchicum autumnale L. Hardwick, Mrs. Worley, 2.

Scirpus fluitans L. Binfield Heath, 7.

Carex paludosa Good. or *C. acutiformis* Ehrh. Two-styled form in Headington Wick, Prof. Balfour.—*C. disticha* Huds. First record Bobart, *vide* spec. in Hb. Morison, ex pratis Ædis Christi.—Var. *longibracteata* Schleich. Bullingdon, 6.—*C. dioica* L. Boggy ground near Islip, W. W. Saunders, 4.—*C. flava* L. In the Morison herbarium there is a specimen of this, labelled "*Gr. cyperoides minimum spica cassa simplici, Raii.* Paludibus variis v. g. apud Hockley, aliisque putrido et spongioso solo haud longe ab Oxonio." The description and accompanying figure in 'Historia,' iii. 244, are *C. dioica.* Bobart therefore precedes Blackstone as the discoverer of *C. flava* in the county.—*C. Goodenovii* Gay=*C. stolonifera* Hoppe, 1835. Was first found in Oxford by Tilleman Bobart; see Morison's Hist. iii. 213, "in sylvarum planitiebus et earum marginibus, in pascuis quoque humidioribus reperitur." — *C. vulpina* L. The forms var. *decomposita* Gray, *aristata* Gray, and *acuta* Gray have been noticed.

Setaria glauca Beauv. Waste ground, Oxford, 1886.

**Panicum sanguinale* L. Waste ground, Portmeadow, 1889, 5.

Alopecurus fulvus Sm. Near Ambrosden, 4. The second Oxford station.

Milium effusum L. Chiselhampton, 6.

Deschampsia cæspitosa L., var. *pallida* (Koch). Crowell Wood (the var. *argentea* of Gray). — Var. *pauciflora* (sub *Aria*) Thuill. Aston Wood.

Avena pubescens Huds. Cottesford; Hardwick Heath, 2. — *A. pratensis* L. Hardwick Heath, 2; The Park, Oxford, 4.

Trisetum pratense Pers., var. *lutescens* mihi, sub *Avena* Reichb. Mesopotamia, 4.

Agrostis alba L., var. *gigantea* Meyer. Rail-bank near Oxford, 5, *teste* Hackel.

Aira caryophyllea L. Hardwick Heath, 2. With *A. præcox* L.

Koeleria cristata Pers. Hardwick Heath, 2; Chastleton Camp, 5; Holton Quarries, 6. — Var. *gracilis* Bor. Hardwick Heath, 2; Ipsden, 7.

Molinia varia Schrank. Bayswater, 4.

Bromus erectus Huds., var. *hirsutus* Parn. Kirtlington, 4. — *B. mollis* L., var. *interruptus* Hack. Goring, 7, 1889. In its second British station; see 'Report of Record Club,' 1888, p. 240.

Festuca rubra L., var. *commutata* Gaud. = var. *fallax* Hackel. = *F. fallax* Thuill. Forest Hill, Stow Wood, 4. — **F. heterophylla* Lamk. Chiselhampton, May, 1888, 6. With it grew *Poa pratensis*, *Milium effusum*, and other native plants, but *Lilium Martagon*, *Tulipa*, *Ornithogalum umbellatum* were in the vicinity. I could hear nothing of any grass-seeds having been sown there. — *F. ovina* L., var. b. *paludosa* Gaud. Fl. Helv. 1828 = var. *capillata* Hack. Stow Wood, 4. — Var. *vulgaris* Koch. Minster Lovell, 5, &c. — Var. *duriuscula* Hack. sub. var. *trachyphylla* Hack. — ? *F. rigida* Kunth. Cottesford, 2.—*F. sciuroides* Roth. Hardwick Heath, 2.—*F. elatior* L., var. *elongata* (Ehrh.), is the hybrid grass which occurs at South Stoke, &c. It is probably identical with Hudson's *F. loliacea* ed. 2; and also probably with *Lolium festucaceum* Link.

Glyceria plicata Fries, var. *depauperata* Crep., *teste* Hackel. Oxford, 5. The type at Cottesford, 2. First record, Dr. Ayres, 1844, sub nom. *G. fluitans* in Hb. Oxon.—**G. distans* Wahl. Waste ground, Portmeadow, 1889.

Poa nemoralis L. Tusmore Wood, 2.—*P. compressa* L. Cottesford, 2.—Var. *polynoda* (Parn.). Botley, 5.

Calatrosa aquatica Beauv. Cottesford, 2.

Agropyron repens Beauv., var. *dumetorum* Reichb. Wheatley, 6. —Var. *Leersianum* Gray = *barbatum* Duval Jouve sub *Tritico*; not infrequent.

Brachypodium pinnatum Beauv., var. *pubescens* Gray (earlier than Syme). Ardley, 2. — Var. *cæspitosum* (R. et S.), Cottesford, 2.— Var. *cornutum* (Reich.). Ardley, 2.—*B. gracile* Beauv. = *B. sylvaticum* R. et S., var. *pubescens* Gray. Common.

Blechnum spicant Roth. Hookend, Rev. C. Abbey, 7.

Lastrea dilatata Presl. Tusmore, 2.

**Polypodium Dryopteris* L. Woods on the Chilterns, 1887, 7; see Journ. Bot. 1887, p. 314.

Botrychium Lunaria L. Hardwick Heath, Mrs. Worley, 2. "In Stow Wood, not farre from a little house called Stockers, where I have been shewed it by my ingenious friend *Mr. Wm. Browne.*"—Coles' 'Adam in Eden,' first record, 1657. "It groweth betweene 2 olde Buttes going from Oxford to Heddington."—MS. note in Lyte. 4.

Ophioglossum vulgatum L. Cottesford, Mrs. Worley; Shelswell, Rev. T. Martyn, 2; Stoke Talmage, Miss Hamersley, 6; Beacon Hill, Miss Beatrice Taylor; Checkendon, Rev. C. Abbey, 7.

Lycopodium Selago L. Shotridge Wood, Miss Smith and Miss Beatrice Taylor!, 1887, 7.

**Tolypella intricata* Leonh. Marston, 4.

Equisetum arvense L., var. *nemorosum* Braun. Godstow, 5.

I am indebted to Mr. Arthur Bennett, Prof. Haussknecht, Prof. Hackel, M. Crépin, M. Barbey, Prof. Engler, Dr. Focke, Dr. Schönland, Rev. W. Moyle Rogers, F. Townsend, M.P., the Abbé Strail, Mr. J. G. Baker, Dr. Buchanan White, &c., for kind assistance.

ON *SPARGANIUM*.

By William H. Beeby.

In previous papers I have dealt principally with the relationship existing between *Sparganium ramosum* and *S. neglectum;* on the present occasion it is proposed to offer some remarks on the British species generally.

The chief aim of my visit to Shetland, in 1886, was to ascertain whether there were present there any of the Scandinavian species of *Sparganium* beyond those at present known to occur in the British Islands; one at least of which, *S. hyperboreum* Laest., growing as it does both in Norway and in Iceland, might reasonably be looked for in one or other of the lochs and tarns which occur so plentifully scattered over some of the larger of the hundred islands which form the Shetland group. Neither in that year, however, nor in visits made in the three subsequent years, were any of them detected; and there would not now seem to be any great reason to expect an addition to the number of our species, unless as a rarity in some isolated locality. The above named plant is the one most likely to be found in Britain, and it might easily be passed over owing to its resemblance to *S. minimum* Fries. The occurrence of *S. fluitans* Fries may be regarded as next in order of probability, whilst the least likely of all to be found, judging by our knowledge of distribution, is *S. natans* L. With regard to this last name, it may not be out of place to state here clearly how the case really stands.

The *S. natans* L. Spec. Plant., is unquestionably an aggregate name, intended to include, so far as we can gather the purpose of Linné, all the floating forms; and including, according to the synonymy given, two perfectly distinct species. (The object of previous notes on this name has not been to strongly advocate its retention, but rather to insist that the name must be applied as in Flo. Danica Suppl., or dropped altogether.) It has been remarked that the second and third synonyms quoted in the 'Species Plantarum' do not belong to the plant now known as *S. natans* L.; this is true enough, for one at least of them belongs to *S. minimum* Fries; and it may be added that the *S. natans* of Linn. Herb. is also *S. minimum* Fries, accompanied by a scrap which, when I examined the plants some six years ago, I was not able to determine with certainty. But when attempting to ascertain whether there exist any grounds on which an aggregate name can fairly be used in a segregate sense, it will hardly do to take into consideration the second and third synonyms while practically ignoring the first, all three of them belonging to the ante-binomial period. Now the first synonym quoted in the 'Species Plantarum' is Linné's own *Sparganium foliis natantibus plano-convexis*, Flo. Lapp. ed. i. p. 271, at the time it was described, a new species. The description given in the 'Flora Lapponica' is, of course, not quite what would be written by a specialist in the genus at the present day; still, so far as it goes, it may very well represent the plant now known as *S. natans* L.; there is nothing in the description antagonistic to its use in this sense, while several characters given are quite distinctive. But there is another point in connection with the Flo. Lapp. plant which is of equal importance, while it does not admit of any doubt; and that is that the description is beyond question absolutely inapplicable to *S. affine* Schniz., and still more inapplicable to *S. minimum* Fries. This being the case, I aver that if the name *S. natans* L. is to be retained at all, it must be applied in the sense of the first synonym quoted in 'Species Plantarum,' ignoring the second and third synonyms in favour of the first; not ignoring the first, Linné's own, synonym in favour of the second and third, which refer to other plants. The name is certainly more deserving of retention than many other Linnean names still used by some writers; moreover, its meaning is now pretty well known, while most modern botanists have seen the errors of their ways, and have ceased to apply it either to *S. affine* or to *S. minimum*. An exception, however, is to be found in Dr. Meinshausen, who, in his "Die Sparganien Russlands" ('Bull. de la Soc. Impér. des Nat. de Moscow,' 1889, No. 1), makes *S. affine* to be simply a synonym of *S. natans* L. Dr. Meinshausen, however, scarcely takes us beyond the time of Fries' writings, while our knowledge of the genus has certainly greatly increased since that time; nor does he even quote the plates, in Flo. Danica Suppl., of the Scandinavian species; and however few references may be given, these plates, at least, do not admit of being passed over in any modern review dealing with the more boreal European forms. It may be added that Dr. Meinshausen's acquaintance with *S. affine* appears to be slight, which is, perhaps, not altogether surprising, as its distribution is not known to extend to Russia.

In continuation of former notes, I now give the following additional counties whence I have seen specimens of *S. ramosum* and *S. neglectum*:—

S. ramosum Curtis.—Devon north, *W. P. Hiern;* Essex north, *J. C. Shenstone;* Suffolk east, *W. M. Hind;* Hereford, *A. Ley;* Pembroke, *C. Bailey;* Elgin, *G. C. Druce;* Easterness, *G. C. Druce.*

S. neglectum Beeby. — Cornwall west, *C. A. Wright;* Devon south, *W. P. Hiern;* Devon north, *W. P. Hiern;* Wilts north, *W A. Clarke* (com. *Arthur Bennett*); Dorset, — *Galpin* (com. *Arthur Bennett*); Hereford, *A. Ley;* Pembroke, *C. Bailey.*

The more southern range of *S. neglectum* continues to be fully confirmed by such specimens as have been seen up to the present time. The occurrence of the plant in one locality in Denmark (Neuman sp.!) in about the same latitude as Berwick-on-Tweed makes it possible, however, that it may be found so far north as the South of Scotland, although it can only be expected to occur as a rare plant in such latitudes.

Variation.—The *Spargania*, like all water-plants, present a very much wider range of states due to local or temporary conditions than is, naturally, the case with land-plants; and these states, as with other aquatics such as *Batrachium*, *Potamogeton*, &c., are often elevated to the rank of varieties. I am disposed to regard the *S. ramosum* var. *microcarpum* Neuman as the only case of a good variety of a British species which I have yet seen in the genus. Even here intermediate forms certainly occur, but the variety is generally well-marked, is quite permanent, occurring in quantities where no other form is to be seen, or maintaining its characters year after year when growing mixed with *S. ramosum* type, *S. neglectum*, and *S. simplex;* and that it is not the result of local or temporary causes or conditions I have proved. It is true that in the excellent account of this genus, from the pen of my friend Dr. Neuman, in the new edition of Hartman's 'Flora,' several other varieties are described; but taking, for example, his varieties β and γ of *S. affine*, I can regard them as nothing more than respectively a land state, and a depauperate alpine or hyperborean state, of the type. The land state, so far as Britain is concerned, I have only seen in Watson's Herbarium at Kew, from the old Surrey station; and the label mentions that the plant grew on mud, the pond having dried up in 1870, when Watson gathered it. When I gathered *S. affine* at the very same spot in Surrey, in 1888, the pond was decidedly wet; so much so that I had to wade over knee-deep to get the plant at all. That year the plant was quite typical *affine*, and was indeed afterwards confirmed by Neuman as his type, **a** *zosteræfolium!* The size of heads, length of peduncle, &c., are liable, as in *S. simplex*, to an unlimited amount of variation, according to local circumstances. The *S. simplex* var. *longissimum* Fries I can also scarcely regard as anything more than a state, though in some doubt whether it may not be desirable that it should appear in our lists as a form, owing to its being so characteristic of the most northern latitudes of our islands, where the normal erect state seems to be wanting; for here the plant seems to be unable to grow except in tolerably deep water, and consequently always assumes its floating state.

Hybridity.—There is no doubt in my own mind that the different species occasionally cross, though perhaps not so frequently as in some other genera. The best instances have come before me in Shetland, where *S. affine* grows intermixed with the floating state of *S. simplex.* The resulting hybrid differs from both of the parents in being totally sterile, while in its more erect habit (thus approaching the normal form of *S. simplex*, which does not occur in Shetland), the greater vegetative activity, common in sterile hybrids, is shown. The other characters are intermediate. I have received from Dr. Neuman Swedish examples of this hybrid, as well as of *S. ramosum* × *simplex.* In Britain I have seen examples which are probably hybrids *S. ramosum* × *neglectum* and *S. neglectum* × *simplex*, but concerning these further observation is necessary.

The Stigma.—What has hitherto been called the "style" is in reality a true beak of the fruit. The stigma is sessile, or it may be regarded as a style which is stigmatic on one surface throughout its whole length. It is obliquely decurrent on the beak for a very short distance. In dried specimens the difference is not perceptible, but in fresh fruits the beak is seen to be of the same colour and herbaceous texture as the rest of the fruit, and its junction with the hyaline stigma, obliquely sessile on its apex, is easily seen.

Fertilisation.—Dr. Focke has well remarked* that the *Spargania* are eminently proterogynous. So far as I have observed, they are chiefly wind-fertilised; while in the floating species the pollen is doubtless sometimes carried to other plants on the surface of the water. Neither the erect nor the floating forms appear to be visited by insects except by rare accident.

The subject of hybridity in this genus seems to afford considerable opportunity for further research, but continued out-door observations are necessary; and a ground-work of knowledge, founded on the study of the plants as they grow, is an essential preliminary to the comprehension of the often illusory characters presented by dried specimens whether of the hybrids or the species themselves. Unfortunately the preliminary is too often neglected, not alone in this genus, and the resulting consequences cannot fail often to appear grotesque, at least to those who know something of the plants themselves and not their reputed measurements merely.

ADDITIONS TO THE IRISH MOSS FLORA.

By David McArdle.

In the April number of the 'Revue Bryologique,' there is an interesting note on *Hypnum circinale* Hook. by M. J. Cardot, an eminent French botanist, who detected it amongst some mosses belonging to the North American *Drepanium* group of Hypnums, which he was studying and comparing with European forms. He writes as follows :—

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* Abhandl. Naturwiss. Ver. z. Bremen, v. p. 409.

"I was surprised to find in my herbarium a little barren specimen of *Hypnum circinale* Hook., gathered at Killarney (Ireland) by Mons. D. Moore. This specimen came from the herbarium of my honoured father-in-law, M. Piri, and is labelled *Hypnum hamulosum* B. S. Damp rocks, Killarney (Ireland), leg. D. Moore. The specimen gathered at Killarney, according to the label, on rocks is quite identical with the specimens growing on bark from North America."

I wrote to M. J. Cardot asking him for a small portion, that I might be enabled to identify the plant, and he very kindly sent me the specimen which he stated he had already shown to Dr. Braithwaite. I am a little puzzled to know why Dr. Braithwaite should take it for any form of *H. hamulosum*, as its appearance at once suggests *H. cupressiforme*, especially the *filiforme* group, and I fear there has been some mistake as to where it was found growing, probably through a mis-translation. It was more likely to be found by Dr. Moore on rotting wood among the damp moist rocks at Killarney. I have sent M. Cardot a specimen gathered in the same locality, found on the bark of trees, which I could not well separate from it. It is described in Müller's 'Synopsis Muscorum,' vol. ii. p. 318. "*H. circinale* Hook. Musc. Ex. t. 107. Patria. In arboribus in plaga occidentali Americæ meridionalis (*Menzies*, 1793) E Chile habuit *Hampe*." "*H.* (*Stereodon*) *circinalis* (Menz. Hook.)" Bridel, Bryologia Universa, vol. ii., p. 621. It is also described by Lesquereux, in his 'Mosses of North America.'

H. canariense Brid. *Neckera canariensis* Brid. (Sp. Musc. ii. p. 29); Müller, Syn. Musc. ii. p. 109. *Hypnum flagellis instar caudæ vulpinæ*, Dill. Musc. p. 306, t. 39, fig. 41. *Astrodontium canariense* Dill., Brid. vol. ii. p. 220.

"In omnibus insulis Canariis præsertim in Teneriffa sylvis prope Lagunam truncus arborum vetustos habitans. Hb. Dillen Kudley, Bory, St. Vincent, Prof. Schmidt, 1815. Hab. On trunks of trees, Cromaglown, Killarney (near the Hunting Tower), Dr. Moore, 1872. fide S. O. Lindberg."

A number of the mosses which inhabit Ireland have a remarkable geographical distribution over various distant parts of the world, affording subject for reflection on the climatical conditions of plant life.

We will take at random a few familiar instances. The well known aquatics, *Fontinalis antipyretica* and *F. squammosa*, are found in North America; *Cryphæa heteromalla* in North America; *Hypnum molluscum* in Northern India and North America; *H. sericeum* in North America, from Canada to the Rocky Mountains; *Andrea petrophila* Ehrhart, from New Zealand, Northern Island, Fuegia, Tasmania, Andes of South America; this was found by Dr. Moore, luxuriating on the rocks at Lugnaquilla, Wicklow, and in Connemara, Galway. Several species of *Sphagnum*, *Fissidens bryoides*, and *F. viridulus*, are found in New Zealand, Northern Island, Bay of Islands, and North America. The rare *Campylopus introflexus*

Bridel, found at Cromaglown, Killarney, by Dr. Moore and Dr. Carrington, was collected by Sir J. D. Hooker, in Lord Auckland's group, and Campbell Island, N. Zealand. *Bartramia Halleriana* Hedw., collected by Dr. Moore, in Collin Glen, near Belfast, is also found in North and South America, Fuegia, Australia, Tasmania, and the mountains of India and Africa. *Hookeria lætevirens* Hook. & Tayl., one of the most beautiful mosses which is found in the West Indies, luxuriates at O'Sullivan's Cascade, Killarney. These are but a few instances in which these minute plants demonstrate that, in climatic conditions, Ireland can compare favourably with many distant lands in the tropical and sub-tropical parts of the world.

SYNOPSIS OF GENERA AND SPECIES OF *MALVEÆ*.

By Edmund G. Baker, F.L.S.

(Continued from p. 213.)

16. L. STENOPETALA Coss. et Dur. — Caulis perennis, foliis inferioribus cordato-ovatis pubescentibus lobatis serratis superioribus trilobis medio longiore basi cuneatis vel subcordatis, petiolis longis, floribus breviter pedicellatis solitariis, bracteolis parvis ovatis obtusis calyce brevioribus non accrescentibus, sepalis triangularibus acutis, petalis roseis angustis profunde bilobis, carpellis hirtis dorso rotundatis carinatis.

Hab. Algeria!

Stem 2–5 ft.; leaves 2–3 in. long; bracts $\frac{1}{5}$ in.; sepals $\frac{1}{3}$ in.; petals 1–1$\frac{1}{4}$ in.

17. L. KASHMIRIANA Camb. in Jacquemont, Voy. Bot. 29, t. 32; Fl. Ind. i. 319. — Caule piloso, foliis inferioribus cordato-orbicularibus 5-lobatis superioribus 3–5-lobatis lobo medio longiore, stipulis lineari-lanceolatis, floribus axillaribus solitariis, bracteolis ovatis acutis accrescentibus, petalis bilobis roseis, carpellis glabris dorso rotundatis carinatis.

Hab. Kashmir!

Stem 2–3 ft.; leaves 2–3 in. long; bracts $\frac{1}{3}$ in.; sepals $\frac{1}{2}$ in.; petals 1$\frac{1}{4}$–1$\frac{1}{2}$ in.

18. L. PLEBEIA Sims in Bot. Mag. t. 2269; DC. Prod. i. 439, Fl. Austral. i. 185. *Malva Behriana* Schlecht. in Linn. xx. 633. *M. Preissiana* Miq. in Pl. Preiss. i. 238. *Lavatera Behriana* Schlecht. in Linn. xxiv. 699. *L. Weinmanniana* Bess. Hort. Crem. 1823; Rchb. Ic. Bot. Exot. t. 60. *L. australis* Walp. Rep. i. 291.— Caule herbaceo erecto scabro vel tomentoso, foliis cordato-orbicularibus 5–7-lobatis, petiolis longis, pedunculis aggregatis vel solitariis, bracteolis ovatis calyce brevioribus, sepalis ovatis acutis, petalis pallide roseis vel albis, carpellis dorso planis margine acute.

Hab. Australia!

Stem 2–5 ft.; leaves 1$\frac{1}{2}$–2 in. long; bracts $\frac{1}{4}$ in.; sepals $\frac{1}{3}$ in.; petals 1–1$\frac{1}{2}$ in.

This plant varies much in pubescence.

Sect. 3. *Oxolopha* DC. Prod. i. 439.—Axis sub apice truncato vel conico in cristas tot quot carpella membranaceas laterales verticales expansus. Flores axillares solitarii vel fasciculati.

* *Americanes.*

19. L. ASSURGENTIFLORA Kellogg in Proc. Calif. Acad. i. 11 and 14.—Caule arborescente, foliis magnis longe petiolatis palmatilobatis crenatis, floribus axillaribus binis, bracteolis coriaceis triangularibus obtusis dimidio calyce brevioribus, sepalis triangularibus acuminatis externe rugosis, petalis roseis striatis, carpellis 6–8 dorso planis puberulis.

Hab. Island of San Miquel, California!

Stem 6–15 ft. high; leaves 4–6 in. long by 3–6 broad; bracts $\frac{1}{3}$ in. long; sepals $\frac{2}{3}$ in.; petals $1\frac{1}{2}$ in.

20.? L. VENOSA S. Watson in Proc. Amer. Acad. 12, 249.—Foliis palmatilobatis, lobis triangularibus acutis, floribus axillaribus aggregatis, bracteolis fere distinctis oblongis ovatis acutis calyce subæquantibus, petalis cuneatis obcordatis purpureis striatis, carpellis 10 faciebus striatis.

Hab. San Benito, California.

Leaves 3–4 in. broad; 1–$1\frac{1}{2}$ in. long; bracts $\frac{1}{3}$ in.; sepals $\frac{1}{3}$ in., becoming $\frac{1}{2}$ in.; petals $1\frac{1}{4}$ in.

This plant and the preceding are closely related to the other American species, *L. insularis* and *L. occidentalis.*

** *Gerontogeæ.*

21. L. MARITIMA Gouan; DC. Prod. i. 439; Rchb. Ic. Flor. Germ. v. t. 178. *L. rotundifolia* Lam. Fl. Fr. iii. p. 138. *L. triloba* Gouan, Fl. Monsp. 48, non L.—Caule fruticoso, foliis tomentosis cordato-orbicularibus palmatilobatis crenatis, floribus solitariis axillaribus, bracteolis ovatis molliter tomentosis calyce brevioribus, sepalis triangularibus acutis, petalis late obcordatis pallide roseis ungue purpureis, carpellis magnis glabris margine acute dorso carinatis faciebus radiatim striatis.

Hab. West Mediterranean Region!

Stem 2–4 ft.; leaves 1–$1\frac{1}{2}$ in. long; bracts $\frac{1}{3}$ in.; sepals $\frac{1}{2}$ in.; petals 1 in.

22. L. OBLONGIFOLIA Boiss. Voy. Esp. p. iii. t. 33; Willk. et Lange, Fl. Hisp. 3, p. 582.—Fruticosa tomentosa crasso incano tecta, foliis breviter petiolatis ovato-lanceolatis crassis rugosis, pedunculis solitariis, bracteolis late triangularibus obtusis calyce dimidio brevioribus, sepalis lanceolatis acuminatis, petalis roseis basi purpureis, carpellis glabris angustis dorso rotundatis bicuspis.

Hab. Spain!

Stem 2–4 ft.; leaves 1–$1\frac{3}{4}$ long; bracts $\frac{1}{4}$ in.; sepals $\frac{1}{2}$ in.; petals nearly 1 in.

Easily distinguished by its thick, brown, woolly tomentum.

23. L. TRILOBA L.; DC. Prod. i. 639; Bot. Reg. t. 1039; Bot. Mag. t. 2226; Jacq. Hort. Vind. t. 74. *L. calycina* Poir. Encyc. Suppl. 3, p. 310. *L. moschata* Moris, Stirp. Sard. Elench. i. p. 9.

L. rupestris Pomel, Nuov. Mat. Fl. Atl. p, 343. *L. rotundata* Lazar in Trab. Soc. Linn. Matr. (1880), 33.—Caule fruticoso tomentoso, foliis longe petiolatis cordato-orbicularibus tomentosis superioribus obsolete trilobis serratis, stipulis magnis ovatis, floribus aggregatis rarius subsolitariis, bracteolis acutis calyce brevioribus, sepalis triangularibus, petalis obcuneatis roseis purpureo-striatis, carpellis dorso rotundatis hirtis vel glabris.

Hab. Spain! Sardinia! Algeria.

Stem 2–4 ft.; leaves 1½–2½ in. long; bracts ½ in.; sepals ¾ in.; petals ¾–1 in.

Var. PALLESCENS = *L. pallescens* Moris. Fl. Sard. i. 301. *Malva Mulleri* Hochst.—Stipulis floribusque minoribus quam typicalibus, petalis ovatis.

Hab. Island of S. Pietro!

Var. MINORICENSIS = *L. minoricensis* Camb. Enum. Pl. Ins. Balearic. p. 163. *Malva minoricensis* Rodrig. Cat. Pl. Minorca, Suppl. p. 9.—Foliis cordato-subrotundatis crenatis crispis 3–5-lobatis tomentosis, stipulis brevis ovato-lanceolatis, petalis roseis calyce vix longioribus.

Hab. Minorca!

Sect. 4. *Stegia* DC. Fl. Fr. iv. p. 835.—Axis in discum amplum expansus. Pedunculi axillares solitarii.

24. L. TRIMESTRIS L.; DC. Prod. i. 438; Rchb. Ic. Flor. Germ. v. t. 176; Bot. Mag. t. 109; Jack. Hort. Vindob. t. 72. *L. alba* Medic. Malv. 41. *L. altheæfolia* Mill. Dict. n. 1. *L. africana* Mill. Dict. n. 2. *L. grandiflora* Mnch. Meth. 614. *Stegia Lavatera* DC. Fl. Fr. 4, p. 836. *L. mauritanica* Desf. non Durieu.—Caule herbaceo hirte vel glabro, foliis longe petiolatis cordato-ovatis acute lobatis serratis, floribus magnis, bracteolis calyce brevioribus ovatis accrescentibus, sepalis lanceolatis acuminatis, petalis roseis interdum albis, carpellis parvis glabris dorso rotundatis.

Hab. From South of France, Spain and Marocco, to Syria!

Stem 2–4 ft. high; leaves 1½–3 in. long; bracts ⅓ in.; sepals nearly ½ in.; petals 1½–1¾ in.

Var. MALVÆFORMIS Ball in Journ. Linn. Soc. xvi. p. 376.—Foliis subrotundatis superioribus vix angulatis, floribus minoribus pallide purpureis.

Hab. Reraya, Marocco!

Non satis notæ.

Lavatera albida Boj. Hort. Maurit. p. 26.
L. brachyfolia Walp. Rep. i. 291.
L. lanceolata Willd.; DC. Prod. i. 440.
L. lusitanica L.; DC. Prod. i. 439.
L. muricata Panc.
L. subovata DC. Prod. i. 439.
L. tripartita DC. Prod. i. 440.

Species exclusæ.

Lavatera Julii Burch., and *L. biflora* E. Mey = *Sphæralcea* (*Sphæroma*) *Julii* (Harv.).

L. prostrata E. Mey = *Sphæralcea* (*Sphæroma*) *prostrata* (Harv.).

VI. MALVA Linn. Gen. n. 841. — Bracteolæ 3 v. 2 distinctæ. Carpella intus nuda, erostria. Styli intus longitudinaliter stigmatosi.

Sect. 1. *Bismalvæ* Medik.; DC. Prod. i. 432. — Bracteolæ 3. Flores axillares solitarii; sæpe quoque terminales et in apice caulis ramorumque congesti. Folia profunde divisa vel partita.

1. Malva Alcea L.; DC. Prod, i. 432; Bot. Mag. t. 2297; Rchb. Ic. Flor. Germ. v. t. 169. *Malva italica* Poll. hort et prov. Veron. p. 17; Rchb. Ic. Flor. Germ. v. t. 170. *M. Alcea β. multidentata* Koch, Synop. ed. 3, p. 112. *M. excisa* Rchb. Ic. Flor. Germ. v. t. 170. *M. cannabina* Serres in Bull. Soc. Bot. Fr. iii. 276. *M. intermedia* Bor. Fl. du Centr. Fr. ed. 2. p. 98.— Caulibus erectis, foliis inferioribus cordato-rotundatis superioribus palmatisectis segmentis pinnatifidis, floribus magnis, bracteolis ovato-lanceolatis, sepalis triangularibus acutis, petalis intense roseis calyce triplo longioribus, axe conico acuminato, carpellis glabris dorso rotundatis carinatis faciebus radiatim rugosis.

Hab. South Sweden! Central Europe! France! Spain! Italy!

Stem 3 ft. high; leaves 1½–4 in. long; bracts ⅓ in.; sepals ⅓ in.; petals 1¼ in.

Var. fastigiata = *M. fastigiata* Cav.; DC. Prod. i. 432; Rchb. Ic. Flor. Germ. v. t. 171. *M. decumbens* Host. Fl. Austr. ii. p. 298. *M. Bismalva* Bern. Rchb. Ic. Flor. Germ. v. t. 172.—Foliis minus divisis cordato-quinquelobis lobis inæqualiter dentato-crenatis lobo medio longiore, floribus axillaribus et summis fastigiatis, axe conico.

Hab. Spain! France!

Var. Morenii DC. Prod. i. 432 = *M. Morenii* Poll. Fl. Veron. ii. p. 437; Bot. Mag. t. 2793; Rchb. Ic. Flor. Germ. v. t. 171. *M. Alcea* var. *fastigiata* Koch, Synop. ed. 3, p. 112. *M. Alceoides* Ten. Fl. Neap. ii. 109. Foliis superioribus palmatisectis summis quoque tripartitis, colore petalorum pallide lilacino, floribus axillaribus et summis fastigiatis, axe conico.

Hab. Spain! France! Italy! Germany!

Var. Colmeiroi = *M. Colmeiroi* Willk. Pug. n. 11. — Foliis superioribus palmatisectis segmentis lateralibus bipartitis medio tripartito, axe in discum depressum expanso.

Hab. Spain.

2. M. moschata L.; DC. Prod. i. 432; Rchb. Ic. Flor. Germ. v. t. 169; Bot. Mag. t. 2298; Eng. Bot. ed. 3, t. 280. *M. Orsiniana* Ten. Fl. Nap. v. p. 85. *M. geraniifolia* Gay in Ann. Sc. Nat. (1836). *M. laciniata* Desr. in Lam. Encyc. iii. 750. *M. Lamottei* Jord. — Caule erecto, foliis inferioribus cordato-suborbicularibus

lobatis superioribus palmatisectis segments pinnatifidis, floribus axillaribus et summis sæpe umbellato-fastigiatis, bracteolis angusto-lanceolatis, sepalis triangularibus acutis, petalis roseis calyce duplo triplove longioribus, carpellis hirsutissimis margine rotundatis.

Hab. Western, Central and Southern Europe! extending northward to South Sweden and eastwards to Dalmatia.

Stem 1–3 ft. high; leaves 1–3 in. long; bracts $\frac{1}{4}$ in.; sepals $\frac{1}{3}$ in.; petals $\frac{1}{2}$–1 in.

3. M. Tournefortiana L.; DC. Prod. i. 432. *M. maritima* Lam. Fl. Fr. iii. p. 140. *M. moschata β. tenuifolia* Guss, Syn. ii. p. 221.—Caule erecto, foliis inferioribus suborbicularibus limbo palmatosecto superioribus pinnatipartitis laciniis bifidis vel trifidis, floribus longe pedunculatis, bracteolis parvis lineari-lanceolatis, sepalis ovatis acutis, petalis purpureis, carpellis 16–20 puberulis dorso rotundatis faciebus elevatim rugosis.

Hab. Spain! France! Italy! Sicily! Greece! Marocco!

Stem 1–2 ft. high; leaves 1–2 in. long; bracts $\frac{1}{8}$ in.; sepals $\frac{1}{4}$ in.; petals 1 in.

Differs from *M. moschata* in its more finely-cut leaves, paler flowers, and smaller carpels with rugose sides.

4. M. althæoides Cav.; DC. Prod. i. 432; *M. cretica* Webb, It. p. 60, non Cav.—Multicaulis, caulibus setoso-hirsutis, foliis inferioribus longe petiolatis cordato-orbicularibus lobatis serratis superioribus palmatipartitis summis tripartitis, floribus longe pedunculatis, bracteolis lineari-lanceolatis, sepalis longe acuminatis hirsutis, petalis roseis calyce duplo longioribus, carpellis glabris dorso planis faciebus rugosis.

Hab. Spain! Corsica! Sardinia! Italy!

Stem $\frac{1}{2}$–2 ft. long; leaves 1–2 in.; bracts $\frac{1}{4}$ in.; sepals $\frac{1}{2}$ in.; petals $\frac{3}{4}$–1 in.

Var. cretica = *M. cretica* Cav.; DC. Prod. i. 431. *M. althæoides* Fl. Græc. vi. t. 664. *M. hirsuta* Ten. Prod. p. 40, non Viv.—Corolla calyce subæquante, carpellis glabris dorso planis eleganter transverse rugosis.

Hab. Sicily! Italy! Greece! Crete!

(To be continued.)

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.

By James Britten, F.L.S., and G. S. Boulger, F.L.S.

(Continued from p. 188.)

Robson, Edward (1763–1813): b. Darlington, 17 October, 1763; d. 21 May, 1813. Of Darlington. A.L.S., 1789. Nephew of Stephen Robson. Correspondent of Withering. Described *Ribes spicatum* in Trans. Linn. Soc. iii. 240. "A very assiduous and accurate botanist," E. Bot. 70. "Accomplished draughtsman," Longstaffe. Drawing of *Geaster*, Gent. Mag. Feb., 1792. Contrib. to E. Bot. (92, 611, 1290, &c.), and lists in Brewster's Stockton and Hutchinson's Durham. R. S. C. v. 243; Longstaffe, 'Hist. Darlington,' p. 370; H. Ecroyd Smith, 'Annals of Smith of Cautley,' p. 149.

Robson, Joseph (d. 1885): d. Whitehaven, Cumberland, 1885. Of Whitehaven. A.L.S., 1854. Cat. of pl. of Gosforth, Cumberland. R. S. C. v. 243; Phyt. v. 1854, 1.

Robson, Stephen (1741–1779): b. 24 June, 1741; d. 16 May, 1779. Of Darlington. Correspondent of Curtis. 'British Flora,' 1777. 'Plantæ rariores agro Dunelmensi indigenæ' (privately printed). Bot. Guide, 241. MS. of 'Flora,' letters and herbarium in possession of his grandson, Edward Capper Robson, of Sunderland. Pritz. 266; Jacks. 232; Longstaffe, 'Hist. Darlington,' p. 370; H. Ecroyd Smith, 'Annals of Smith of Cautley,' p. 163.

Roe, John Septimus (d. 1878): d. 23 May, 1878. R.N., F.L.S., 1828. Surveyor-General, W. Australia, 1848. Travelled in West Australia, 1848–9. Collected in Australia, 1835–6. Sent plants to Hügel and Hooker. Fl. Tasm. cxxi; Journ. Bot. 1854–5; R. S. C. v. 251. *Roea* Hüg. = *Sphærolobium* Benth.

Roebuck, John (1718–1794): b. Sheffield, 1718; d. 17 July, 1794. M.D., Leyden, 1743. Chemist, manufacturer, and iron-master. 'On ripening and filling of corn,' Trans. R. S. E. i. 1788, 17. Hoefer; R. S. C. v. 251.

Rogers, John (1752–1842): b. Richmond, Surrey, 10 Feb. 1752; d. Southampton, 9 Nov. 1342; bur. All Saints' Burial-ground, Southampton. Gardener in Royal Gardens, Richmond. Had a herbarium. Autobiog. w. etched portr. by Frank McFadden, 1889.

Rogers, John (fl. 1818–1846). 'Vegetable remains, Porthleven,' Trans. Geol. Soc. Cornwall,' i. 1818, 236. ? M.A., Oxon. F.L.S., 1833. R. S. C. v. 254.

Roget, Peter Mark (1779–1869): b. London, 18 Jan., 1779; d. West Malvern, 12 Sept., 1869. M.D., Edin., 1798. L.R.C.P., 1809. F.R.C.P., 1831. F.R.S., 1814. Sec. R. S., 1827. 'Animal and Vegetable Physiology,' Bridgewater Treatise, 1834. Jacks. 69; Proc. Roy. Soc. xviii. 38; Munk iii. 71.

Ronalds, Hugh (1759–1833): b. Brentford, 4 March, 1759, d. Brentford, 18 Nov., 1833. Nurseryman and seedsman. 'Pyrus Malus Brentfordiensis,' 1831, illustrated by his daughter Elizabeth. Formed a herbarium of Kew plants. Gent. Mag. 1834, i. 337; Pritz. 268; Loud. Gard. Mag. x. 96.

Rooke, Hayman (fl. 1783–99). Major, R.A. Of Whitehaven, Cumberland. Botanical Artist. 'Travels to Arabia Felix,' 1783. 'Oaks at Welbeck,' 1790. 'Sherwood Forest,' 1799. Pritz. 268; Baker, Fl. Lake Distr. 14; Allibone.

Rootsey, Samuel (1788–1855): b. Colchester, 12 Feb. 1788; d. Bristol, 4 Sept., 1855. F.L.S., 1811. Druggist at Bristol, 1812. Lectured on Botany at Bristol and elsewhere. 'Syllabus of Bot. Lectures,' 1818. 'On the Medical Plants of Shakespeare,' Trans. Med.-bot. Soc., 1832. Had a herbarium. Contributed to Swete's Fl. Bristoliensis, see pref. vi. Jacks. 36; R. S. C. v. 271; Proc. Linn. Soc. 1856, xlv.

Roscoe, Mrs. Edward (fl. 1829). 'Floral Illustr. of the Seasons,' 1829. Pritz. 269; Jacks. 407.

Roscoe, William (1753–1831): b. Liverpool, 8 March, 1753; d. Toxteth Park, Liverpool, 30 June, 1831. F.L.S., 1804. Founded Liverpool Bot. Garden, 1802. M.P. for Liverpool, 1806. Correspondent of Smith. 'Scitamineæ,' 1824–28. Contrib. to Linn. Trans., 1806–1814. Pritz. 269; Jacks. 599; R. S. C. v. 274; 'Life,' by his son Henry, 1833; Sm. Corresp. ii. 301; Gent. Mag. 1832, ii. 179; Allibone; Hoefer; Michaud Wedgewood Medallion. Portr. at Kew, engrav. fr. cast by J. Gibson. *Roscoea* Sm.

Rose, Hugh (d. before 1795). Of Norwich. Apothecary. Correspondent of Hudson. Taught J. E. Smith. Had a herbarium. 'Elements of Bot.,' 1775. Pritz. 269; Jacks. 599; Linn. Trans. vii. 297.

Rosenberg, Miss M. E. (fl. 1839–45). Of Bath. 'Corona Amaryllidacea,' 1839. 'Museum of Flowers,' 1845. Jacks. 41.

Roupell, Mrs. A. E. (fl. 1849). Drew plates of 'Specimen of Fl. of South Africa,' 1849. Pritz. 270; Jacks. 347; Bot. Mag. 4466. *Roupellia* Hook.

Rowden, Frances Arabella (fl. 1801–1810). Of Hans Place, London. 'Poetical Introduction to Botany,' 1801. Jacks. 212.

Roxburgh, William (1759–1815): b. Craigie, Ayrshire, 1759; d. Edinburgh, May, 1815. M.D., F.L.S., 1799. H. E. I. C. Medical Service. Superintendent, Calcutta Garden, 1793–1814. At Cape and St. Helena on way home in 1814. List of St. H. Plants in Beatson's 'Tracts relating to St. Helena.' 'Pl. of Coromandel Coast, 1795–8. 'Hortus Bengalensis,' 1814. 'Flora Indica' (posthumous), 1820–32. Plants at Brit. Mus. and Kew. MS. Fl. Indica and drawings of Palms in Bot. Dept., Brit. Mus. Other drawings at Kew and Calcutta Bot. Gard. Pritz. 271; Jacks. 600; Pref. to 'Flora Indica' and 'Coromandel Pl.'; Cott. Gard. vi. 65; R. S. C. v. 314; Allibone. Portr. at Kew, engr. by Warner fr. pen and ink sketch by Sir W. J. Hooker. Monument in Calcutta Garden. *Roxburghia* Dryand.

Royds, Sir John (fl. 1819). Puisne Judge, Supreme Court of Bengal. "A zealous botanist and an eminent benefactor of the science." Roxburgh, Coromandel Plants, iii. 87. *Roydsia* Roxb.

Royle, John Forbes (1799?–1858): b. Cawnpore, 1799?; d. Acton, Middlesex, 2 Jan., 1856. M.D., Munich, 1833. F.L.S., 1833. F.R.S., 1837. Surgeon in H.E.I.C. Medical Service in Bengal, 1820. Curator, Saharunpur, 1823–1831. Prof. Mat. Medic. King's Coll., London, till 1856. Sec. Roy. Hort. Soc. 'Manual of Materia Medica,' 1847. 'Botany of Himalayas,' 1834–38. 'Fibrous Pl. of India,' 1855. Pritz. 271; Jacks. 600; Proc. Linn. Soc. 1858, xxxi; Flora Indica, 64;

R. S. C. v. 316; Gard. Chron. 1858, 20; Cott. Gard. xix. 225, 249. *Roylea* Wall.

Rozea, Richard (d. circ. 1829). Surgeon, of Marylebone. Herbarium collected, 1815-1823, w. W. F. Goodger, afterwards in possession of E. G. Varenne. Fl. Midd. 398.

Rudge, Edward (1763-1846): b. Evesham, 27 June, 1763; d. Evesham, 3 Sept., 1846. F.L.S., 1802. F.R.S., 1805. 'Plantarum Guianæ Icones,' 1805-1807. Proc. Linn. Soc. i. 315, 337; Bot. Mag. 935; Linn. Trans. viii. 326; Pl. in Herb. Mus. Brit. Pritz. 272; Jacks. 375; R. S. C. v. 322; Gent. Mag. 1846, ii. 652. *Rudgea* Salisb.

Rudge, Samuel (fl. 1820). Uncle of foregoing. Of Elstree, Herts. Collected about Elstree, Herts, and Sonning, Berks. Proc. Linn. Soc. i. 337. Pryor, Fl. Herts. xlii. Herb. in Herb. Mus. Brit.

Rufford, Rev. W. S. (d. 1836). Of Badsey. Assisted Purton in the 'Midland Flora,' his wife drawing some of the plates and also collecting plants. Had a herbarium. Purton, Midland Flora, pref. iv.; Appx. vii. 277, &c.; Mag. Nat. Hist. ix. 605.

Rusholm, ——— (fl. 1686). Last Gardener of Westminster Physick Garden. Garden pl. in Herb. Sloane, 24-26 and 110.

Russell, or **Russel, Alexander** (d. 1768): b. Edinburgh; d. Walbrook, 28 November, 1768. M.D., Glasgow. L.R.C.P., 1760. F.R.S. Physician to English factory at Aleppo, circ. 1740-1755. 'Nat. Hist. of Aleppo,' 1756, plates by Ehret. Plants in Herb. Mus. Brit. Jacks. 510. 'Essay on character of.........,' by Fothergill, 1770. Munk. ii. 230; Gent. Mag. xli. Portrait by Dance, engr. by T. Trotter, 1770. *Russelia* Jacq.

Russell, Mrs. Anna, *née* **Worsley** (d. 1876). Of Kenilworth. Studied and drew fungi. Contrib. list of Newbury pl. to Phyt. iii. 716, and list fr. Bristol to N. B. G. Correspondent of H. C. Watson. 730 Drawings of fungi in Mus. Brit. Jacks. 257; Top. Bot. (ed. ii.) 555; Journ. Bot. 1877, 32.

Russell, John, 6th Duke of Bedford (1766-1839): b. 6 July, 1766; d. London, 20 Oct., 1839. Succeeded 1802. F.L.S., 1816. 'Salictum Woburnense,' 1829. Pritz. 274. 'Letter on the late Duke of Bedford,' by Sir. W. Hooker. *Bedfordia* DC.

Russell, John (fl. 1845). 'Theory of Vegetation.' Journ. Agriculture, 1845, 458. R. S. C. viii. 801.

Russell, Patrick (1726-1805): b. Edinburgh, 1726; d. 1805. M.D. F.R.S. Brother of Alexander Russell (*vide supra*). Succeeded him at Aleppo, 1775. Edited 'Natural Hist. of Aleppo,' ed. ii. 1789. 'Aleppo,' ii. 238. Succeeded Koenig as H.E.I.C. Botanist at Madras, 1786. Plants and drawings in Herb. Mus. Brit. Jacks. 510; R. S. C. v. 345; Cunningham, Biog. Hist. Eng. viii. 118; Allibone.

Rutherford, Daniel (1749-1819): b. Edinburgh, Nov., 1749; d. Edinburgh, 15 Nov., 1819. M.D., Edin., 1772. F.L.S., 1796. Chemist. Prof. Bot. Edin. 1786. 'Characteres generum,' 1793. Jacks. 16; Michaud. Engr. vignette portr. pub. by Thornton; Wadd, p. 136; copy at Kew.

Rutherford, Robert (fl. 1699). Surgeon. Sent plants from Carolina to Petiver. Mus. Pet. 46.

Rutty, John (1698–1775): b. Dublin, ? 1698: d. Dublin, 27 April, 1775. M.D., Leyden, 1723. 'Nat. Hist. of Dublin, 1772.' 'Materia Medica,' 1777. Chalmers; Allibone; Friends' Books, ii. 520. *Ruttya* Harv.

Ryan, John (fl. 1797). M.D. F.L.S., 1798. Collected in Santa Cruz, Montserrat, and Trinidad. Furnished Vahl with most of plants figured in his Eclogæ. Specimens in Mus. Brit. Vahl, Eclogæ (Pref. and dedication), 1797. *Ryania* Vahl.

Ryder, Thomas (fl. 1796–1800). Of San Domingo. Doctor. 'Indian Arrow-root,' 1796. Pritz. 275; Jacks. 211.

Sabine, Joseph (1770–1837): b. 1770; d. Hanover Square, London, 24 Jan., 1837; bur. Kensal Green Cemetery. F.L.S., 1798. F.R.S. Barrister. Sec. Hort. Soc. 1810. List of plants in Clutterbuck's 'Hist. of Herts.' 1815. Pritz. 275; R. S. C. v. 354; Gard. Mag. xiii. 144; Cott. Gard. vi. 363; Mag. Nat. Hist. n. s. i. 390; Pryor, Fl. Herts. xli. Litho. portr. after Eddis, at Kew. *Sabinea* DC.

Sadler, John (1837–1882): b. Gibleston, Fife, 3 Feb. 1837; d. Edinburgh, 9 Dec. 1882; bur. Warriston Cemetery. Assistant to Prof. J. H. Balfour, 1854. Sec. Bot. Soc. Ed. 1858. Curator Bot. Gard. Ed. 1879. Papers in Trans. B. S. Ed. Mosses in Brit. Mus. Jacks. 601; Journ. Bot. 1882, 31; Gard. Chron. 1879, i. 76, 81, w. portr.; 1882, ii. 793; Hist. Berwick Nat. Club, x. 72; R. S. C. v. 360. *Salix Sadleri* Syme.

Saintloo, Edward (fl. 1575). Of Somersetshire. Correspondent of Lobel. Pult. i. 106.

Salisbury, Richard Anthony, *né* **Markham** (1761–1829): b. Leeds, 1761; d. London, March, 1829. Of Chapel Allerton, Yorksh. and afterwards of Mill Hill. F.L.S., 1788. F.R.S. First. Sec. Roy. Hort. Soc. 'Icones,' 1791. 'Prodromus stirpium in hort. ad Chapel Allerton,' 1796. 'Paradisus Londinensis,' 1805–8. 'Genera Plantarum,' ed. J. E. Gray, 1866. Descended from Lyte. Contributed to E. B. 17, 21, 262. Had garden at Chapel Allerton and Collinson's at Mill Hill. Drawings and notes in Bot. Dep. Brit. Mus. Pritz. 276; Jacks. 601; R. S. C. v. 378; Lambert, 'Pinus'; Rudge, 'Pl. Guian. pref.; Pref. to his 'Genera of Plants.' Pencil portr. by W. J. Burchell, 1817, at Kew. *Salisburia* Sm. = *Gingko.*

Salisbury, William (fl. 1797–1816). Nurseryman of Chelsea. Partner and successor to Curtis in Brompton Garden, afterwards in Sloane Street, where he had botanical classes. 'Hortus Paddingtonensis, 1797. 'Hortus Siccus Gramineus,' 1816. 'Botanist's Companion.' 1816. Pritz. 276; Jacks. 601; Loudon, 'Arboretum,' 75.

Salmon, John Drew (1802 ?–1859); d. London, 5 Aug. 1859. F.L.S., 1852. Botanist and Ornithologist. Of Thetford (1835–1848) and afterwards of Godalming. MS. Fl. of Surrey incorporated in Brewer's, 1863. 'Fl. of Godalming,' Phyt. ii.

447. Herbarium and diaries in Norwich Museum. Pritz. 277; Jacks. 260; R. S. C. v. 382; Trans. Norf. & Norw. Nat. Soc. ii. 420; Proc. Linn. Soc. 1859–60. xxix.

Salmon, William (1645–1712): b. 1645; d. 1712. M.D. Prof. Med. 'Botanologia: English Herbal,' 1710. Appears to have been in Carolina and Virginia, and to have collected round Lynn and London. Pult. i. 185; Pritz. 277; Jacks. 30; Wadd, 138; Garth's 'Dispensary.' Portr. by White, 1667, in Herbal; one by W. Sherwin, 1670, in 'Polygraphicæ'; one engr. Burnford, 1681, in 'Synopsis Medicinæ'; and one, 1685, in 'Polygraphicæ.'

Salt, Henry (circ. 1785–1827): b. Lichfield, circ. 1785: d. between Cairo and Alexandria, 30 Aug., 1827. F.L.S., 1812. F.R.S. Secretary and draughtsman to Lord Valentia in India and Africa, 1802–1805. Travelled in Abyssinia, 1805 and 1810. 'Voyage to Abyssinia,' 1814. Plants given to Banks and now in Hb. Mus. Brit.; enumerated by Brown in Appendix to Voyage, lxiii. Algæ sent to Dawson Turner ('Fuci,' iv. 38). Life and Correspondence, by J. J. Hall, 1854; Hoefer; Michaud. *Saltia* Brown.

Salt, Jonathan (fl. 1796–1810). Of Sheffield. F.L.S.. 1797. Discovered *Carex elongata* in 1807. "A most assiduous investigator of the vegetable creation," Smith. Contributed to E. Bot. (358, 598, 648, 1920, 2018).

(To be continued.)

SHORT NOTES.

Crepis taraxacifolia in Sussex.—I send some plants of *Crepis taraxacifolia*, new, so far as I know, to E. Sussex, as well as this district. It was first noticed in some rough pastures on the western edge of Pevensey Marsh, where the ground begins to rise by a path which runs from Willingdon Schools to east end of Balton Decoy, by R. B. Postans, Esq., of this town. It was growing in considerable quantity all over one field and in fair abundance in the other. The locality is about three miles from Eastbourne, towards Polegate.—F. C. S. Roper.

Potentilla maculata Pourr. in Dumfries. — Mr. Thornburn Johnstone has sent me a specimen of this plant from the hills near Moffat, where it occurs over a limited area at from 1600 to 1750 ft. Its occurrence is interesting, as it forms a connecting station between there in Cheviotland and the Highlands. With or near it are found *Ajuga pyramidalis* and *Saxifraga nivalis*. — Arthur Bennett.

Merionethshire Plants. — A fortnight's visit to Barmouth, Merioneth, last June, enabled me to secure the following species not yet recorded for the county. A road from Barmouth follows the Mawddoch Estuary to Dolgelley, by the side of which occur a few plants of *Papaver Argemone*, and, more commonly, *Geranium* *pusillum* in grassy places, *Trifolium medium*, *Torilis nodosa* (sparingly in the bordering fields), *Rumex conglomeratus*, *Allium ursinum* (in a copse by a stream), *Galium Mollugo* and *Arum maculatum*. *Sium latifolium* I found in a wet place by the Panorama Walk, cut off nearly to the root, and only to be recognised by foliage and fistular stem; close by *Valerianella Olitoria* also grew. Below Croig Abermaw, in waste places, *Lamium amplexicaule*, *Avena fatua*; and, in the railway-station ground, *Peucedanum sativum*. Crossing by the ferry to the south of the estuary, I found *Cynoglossum officinale* abundantly growing on banks by the sea, in addition to *Milium effusum*, in a wood, and *Stellaria umbrosa*, under a wall along the Towyn Road towards Barmouth Junction. *Luzula pilosa* grows plentifully in the Torrent Walk near Dolgelley, and *Orchis mascula* at the base of Cader Idris; *Ranunculus sceleratus* in ditches and wet places about Barmouth; and *Blysmus rufus* near Llanbedr, in marshes opposite Mochras, complete the list.—H. W. Monington.

Potamogeton fluitans Roth.—It may be well, as a side-light to the note on the above plant (p. 204), to give one of Roth's observations. It occurs in the 'Beiträge zur Botanik,' p. 126, 1783, reproduced in the Tent. Fl. Germ. ii. p. 203:—"Obs. 2. Folia caulina inferiora in planta florente raro observanda sunt perfecta, quia a vermibus destruuntur et putrescunt." The description in the 'Tentamen' is very short, while that in the 'Beiträge' is very full. It cannot, however, be quoted for the name, as it is "sine nomine"; but Roth himself quotes the 'Beiträge' for his *fluitans*. —Arthur Bennett.

In a letter I have recently received from Dr. Tiselius, he urges against the hybrid origin of this species the very forcible argument that it is never difficult to distinguish from its supposed parents; whilst in other supposed hybrids of *Potamogeton* forms occur which closely approach their parent species. I have always felt this to be a serious objection, and that, if it were as well-founded in actual fact as it appears to be in our herbariums, it would be almost conclusive against the hybridity of *fluitans*. But may not this apparent uniformity of type be due to the neglect of collectors, who are apt to look for "typical specimens," and to pass by any form that is not "well-marked"? I plead guilty to this neglect myself, and, judging by what I see in the collections of others, it seems a very common fault. The accidental discovery of a form of *P. fluitans* which might easily have been passed as *P. natans*, induced me to make a careful examination of a district which has not yielded *fluitans* in previous years, with the result that I found several untypical forms. If botanists will search for *fluitans* in waters where *natans* and *lucens* grow together, it is probable they will meet with it. I would especially direct their attention to abnormal forms of *P. natans*, and if any be found without the characteristic *joint* at the base of the leaf, or with *membranous or submembranous lanceolate lower leaves*, I should be very pleased to examine the specimens. —Alfred Fryer.

NOTICES OF BOOKS.

Introduction to Fresh-water Algæ, with an Enumeration of all the British species. By M. C. Cooke, M.A., LL.D., A.L.S. Kegan Paul, Trench, Trübner & Co. London, 1890. 13 tab., illustrating all the genera; 8vo, 334 pp. Price 5s.

The author of this book deserves the highest credit for his good intentions. To furnish the public with a book of handy size containing descriptions of the British Fresh-water Algæ, and figures of all the genera, with an introduction to their study—all this at a reasonable price—is an aim of the most worthy kind. The plan of the book and the idea of producing it are most creditable to Mr. Cooke, but he should have induced some one else to carry the matter into effect.

Soon after the publication of Cooke's 'British Fresh-water Algæ,' it was shown by Dr. Nordstedt in these pages,* and by other writers elsewhere, that Mr. Cooke's claims to illustrate this subject are of the most slender character. Mr. Cooke's methods of book production were then laid bare, and the character of many of his figures was properly described by the most eminent living authority on this subject. It is, of course, impossible for us to know whether Mr. Cooke took that lesson to heart, and has prepared the present volume as some sort of apology for his more ambitious work, or whether he remains "of the same opinion still." Judging from the book before us, the latter view is much the more likely one. In the Introduction, p. 6, Mr. Cooke says:—"The historical review may be briefly summarised by dividing it into three epochs, of about forty years' duration for each, the first being limited by the publication of Dillwyn's 'Confervæ,' the second by Hassall's 'Fresh-water Algæ,' and the third by Cooke's 'British Fresh-water Algæ.'" Here is an author who refers to his own book as an epoch-making one! and such a book! Phycologists live in perilous times when Cooke's 'British Fresh-water Algæ' marks an epoch.

Those who know Mr. Cooke's numerous and varied writings are familiar with his refreshing habit of speaking out the faith that is in him without deference to authority, and with hard words for those who may excite his wrath. His chapter on "Classification" in this book contains a scathing reference to Mr. A. W. Bennett's classification of Algæ, and his chapter on what is here called the "Dual Hypothesis" is to be noted for its outspoken language. Mr. Cooke must be aware that in this matter he lives in a very Crystal Palace of glass, and no doubt he is prepared for sportsmen who may be inclined to return his fire. Let us look at this chapter on the "Dual Hypothesis," not that there is anything dual about the hypothesis, but only about the subjects of it. Most reasonable people have spontaneously remarked that in the controversy, while it lasted, on the subject of the dual nature of lichens, the systematic lichenologists were ranged on one side, and the morphologists pitched over against (and into) them. It was further noted that the question was really one for morphologists to settle, and they settled it. To treat the controversy, with Mr. Cooke, as still active would be absurd. One might as well describe the battle of Balaclava as still in progress because survivors happily remain with us. The question was settled, and it was not decided in favour of the systematists, headed by Nylander. Mr. Cooke, however, digs up the hatchet, and goes for de Bary, Schwendener, and the rest, just as if there were some novelty left in his proceedings. He fortifies himself with the following inspiring sentence written by "Dr. Nylander, the prince of lichenologists":—"I have adduced that the gonidia and gonimia of lichens constitute a normal organic system necessary, and of the greatest physiological importance, so that around them we behold the growing (or vegetative) life chiefly promoted and active." Mr. Cooke quotes this sentence with special approval, and if he can understand it, no doubt he is entitled to use it. For our own part it appears to us that the man who could write a sentence like that is very unlikely to take a lucid view of anything.

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* Journ. Bot. 1887, 355.

It is difficult to take seriously the work of any man on Fresh-water Algæ who describes, in this year of grace 1890, the symbiosis of lichens as a "hallucination" (p. 183). It may be well enough —it is intelligible at any rate—that men like Nylander, Krempelhuber, and others, cited by Mr. Cooke, who have more or less confined their studies to systematic lichenology (a branch of study differing remotely from systematic botany in its extraordinary and absurd methods),—it is well enough that these men should cling to their ancient faith; but when an author presents to the public a book which professes to teach the form and structure of Fresh-water Algæ, it might surely be expected that he should leave this matter alone or take a reasonable view of it. Let him point to distinguished authorities on Fresh-water Algæ who fail to recognise these among the "gonidia" of lichens! If Mr. Cooke expects an attentive hearing on this matter let him not proclaim his own ignorance.

The first 190 pages of this book are of an introductory character. The chapters are on such subjects as collection and preservation, cell-increase, polymorphism, asexual and sexual reproduction, conjugation, pairing of zoospores, alternation of generations, spore germination, spontaneous movements, notable phenomena (such as the "breaking of the meres," Red Snow, Gory Dew, Blood Rain), the dual hypothesis and classification. Over the ground covered by this list of subjects, there is, indeed, wanted a good trustworthy popular guide, though the literature is easily enough got at by students. Mr. Cooke would have been the better for such a guide. His knowledge of the literature as displayed here is certainly scanty and by no means recent. To point out this inadequacy of treatment in anything like detail would be labour spent in vain.

After this introductory portion we have the systematic portion, consisting of short descriptions of the British Fresh-water Algæ, and at the end the figures of the genera. This is better. It might be objected to the descriptions that they are short—so they are, but on the whole they are judiciously shortened; and considering the author's previous work on this subject, there is reason for some satisfaction with this portion of the book. The author contents himself with these descriptions and a reference to his own larger book, and steers clear of the pitfalls of synonymy. As for the plates, they are mostly outline figures redrawn on stone from Cooke's larger book and other sources. It may be that there is somewhere in this book an acknowledgment of the *original* sources of some of these figures, but we have not yet found the place. However, Dr. Nordstedt has already so fully shown what Mr. Cooke can do in this way on a larger scale that there is no special need to deal with the matter. These figures of the genera and the page giving their names constitute the really useful part of this book. It cannot be claimed for it that it embodies the work of an original worker in this field, or of a man who has an extensive, practical first-hand knowledge of the subject, but so far as the latter part (containing the descriptions and figures) is concerned, it may be said of it that it is worth the price charged as a help to the beginner in naming specimens. As for guidance in the structure, life-history, and relationships of these organisms, the student need expect none of it. G. M.

Hepaticæ Bolivianæ. By Richard Spruce. Mem. Torrey Bot. Club, vol. I. No. 3 (1890).

This is another valuable contribution to our knowledge of the hepatic flora of South America by our countryman Dr. Spruce, and we are pleased to observe that he still has that keenness of vision and skill which was manifested in his admirable work 'Hepaticæ Amazonicæ et Andinæ.'

The species described in this memoir are those collected by Dr. Rusby during parts of the years 1885–6, whilst botanising on the eastern slopes of the Bolivian Andes, at an altitude of from 4 to 12,000 ft. His special object was the collection of flowering plants and ferns, but amongst his specimens were a number of hepatics growing principally on the fronds of ferns, as Dr. Spruce remarks, a prolific nidus, more particularly for the minuter species. For example, on an *Acrostichum*, besides a *Radula*, were half-a-dozen *Lejeuneæ;* these specimens, many of them very small, were picked out and numbered by Mrs. Britton, Keeper of the Cryptogamic Herbarium, Columbia College, New York, and forwarded to Dr. Spruce to determine.

The introductory remarks on the geographical distribution of the species are especially interesting: it appears there is a greater correspondence of the hepatic flora of Bolivia with that of Mexico, made known to us mainly by the collection of Liebmann (see the excellent Gottsch. Mex. Leverm.), than with that of the equatorial regions (lat. 0·70° S.), investigated personally by Dr. Spruce. Many of the hepatics of the highlands of Mexico are identical with those collected by Dr. Rusby at nearly the same altitude in Bolivia, although some of them seen nowhere by Dr. Spruce near the Equator. Three Mexican *Plagiochila* are proved to belong also to

Bolivia, although none of them found in the Andes. Another large species, *Lepicolea ochroleuca* N. (*Sendtnera*, Syn. Hep.), which has a range from Mexico to the Falkland Islands, is amongst the Bolivian specimens, but was never found by Dr. Spruce in his extensive travels.

The arrangement of the genera is the same as in 'Hepaticæ Amazonicæ et Andinæ,' except that some alterations are made in their order: these, we presume, reflect the more mature judgment of the author on a subject which has exercised the minds of most of the leading systematists.

About one hundred species are enumerated, of which twenty-seven are new, which are fully and accurately described. In addition to the description of the species, valuable notes are added and some errors in synonymy corrected; the "*Radula xalapensis*" Mont., described by Gottsche in Mex. Leverm., is different from the true species of Montagne, the founder of the species, and is the *Radula ramulina* of Taylor, which comes near to our native *Radula voluta* Tayl., a species erroneously confounded by some authorities with *Radula xalapensis* Mont.

Scapania splendida Spruce, Hep. Am. et And., *Scapania grandis* Boswell, Journ. Bot. 1887, are synonyms for *Scapania Portoricensis* Gottsch. ('Linnæa,' 1853), the only known tropical American species of the genus. Dr. Spruce was not aware of the existence of Hampe & Gottsche's memoir when he published his work in 1885.

Three species, *Lejeunea Rusbyi*, *Bazzania Rusbyi*, *Plagiochila Rusbyi*, are dedicated by Dr. Spruce to the botanical traveller who has done so much to investigate the Flora of Bolivia: the other species are named after some peculiarity of structure, habit, or country. W. H. P.

Flora of Sussex: or, a List of the Flowering Plants and Ferns found in the County of Sussex, with localities of the less common species. By the Rev. F. H. Arnold, M.A., LL.B. London: Hamilton, Adams & Co. 1887. 8vo, pp. xxiii, 118. Price 5s.

This little Flora, although bearing the date of 1887, has only lately come into our hands, and as it does not appear to be generally known, it seems worth while to call attention to it, even thus late.

At the outset it may be stated that it neither is, nor claims to be, up to the standard of certain recent works of the kind. Mr. Arnold has not troubled himself about "first records," to which, indeed, an exaggerated importance seems sometimes to be attached; there are no critical notes, either about the plants themselves or their nomenclature; and the space devoted to Roses, Rubi, and the like, although perhaps as much as they deserve, is by no means proportionate to that which they occupy in most local Floras. On the other hand, owing to the use of small but clear type, and close printing, a great deal more matter is included in the book than might be expected from its small bulk; and those who use it will be grateful to the author for having given them a volume which can be carried about in a pocket of ordinary dimensions.

The introduction, like the body of the book, contains a great deal of matter in small space, and evidences much care and local knowledge. The county is divided into seven botanical districts, which are mainly identical with those defined by Mr. Hemsley in his 'Outline of the Flora of Sussex' appended to this Journal for 1875. Strangely enough, the Medway district has been the least thoroughly examined: this will no doubt receive further elucidation when the long promised and much needed Flora of Kent shall see the light.

The only plant peculiar to the county is *Phyteuma spicatum*, but the Flora, as most botanists know, is a generally interesting one, including such species as *Dentaria bulbifera*, *Viola lactea*, *Vicia lutea*, *Trifolium stellatum* (an introduction holding its ground since 1804), *Seseli Libanotis; Isnardia palustris*, *Phyteuma orbiculare*, *Pyrola media*, *Erythræa capitata*, *Cicendia filiformis*, *Orobanche elatior*, *Melittis Melissophyllum*, *Daphne Mezereum*, *Arum italicum*, *Orchis purpurea*, *Malaxis paludosa*, *Scirpus triqueter*, *S. carinatus*, *Carex stricta*, and *Leersia oryzoides*. *Phyteuma spicatum* is said to be "originally perhaps an escape from Warbleton or Mitchelham Priories, but now established, for more than sixty years, over some miles of country." We were not aware that there was so much doubt as to the nativity of the plant. *Thlaspi perfoliatum* should be printed in italics; it is apparently only a casual introduction, as the only reference is to a specimen from Newhaven in Borrer's herbarium.

Taschenflora des Alpen-Wanderers. Colorirte Abbildungen von 115 verbreiteten Alpenpflanzen, nach der Natur gewalt von Ludwig Schröter. Mit kurzen botanischen Notizen in deutscher, französischer und englischer Sprache von Dr. C. Schröter. Zürich: Meyer & Zeller. 8vo, tt. 18. Price 6 francs.

The title of this little book explains its contents. The authors have figured and described 115 of the most characteristic of the plants met with in ordinary excursions in the Alps, and the result is a little book which, if not very scientific, is likely to be useful to the many who, from all parts of Europe, are making their way to the Swiss mountains and similar holiday resorts. The more usual Gentians, Primroses, Campanulas, Senecios, Ranunculuses, and the like are figured and described in three languages. The English of the descriptions needs revision: at present it reminds us rather too forcibly of 'English as she is spoke.' Thus of *Silene acaulis* we are told that "there are male and female stocks," and that it "forms firm, often footsized, cushions on the arêtes"; *Geum montanum* has "a wig-like rose-tinged head of fruits," and the fruit of *Anemone alpina* forms "a globular wig": *Gentiana punctata* is called "Carved Gentian." But a great deal of interesting and useful information is conveyed in small compass; and many will find the little volume a pleasant travelling companion.

ARTICLES IN JOURNALS.

Bot. Centralblatt (No. 26). — C. Massalongo, *Cylindrosporium Pimpinellæ*, sp. n. — O. Galert, 'Batologische Notizen.' — S. Korzchinsky, 'Ueber eine hybride *Anemone* Ost-Russlands (*A. cærulea* × *ranunculoides*).'—(Nos. 27, 28). J. Seligmann, 'Ueber anatomische Beziehungen der Campanulaceen und Lobeliaceen zu den Compositen.' — F. Ludwig, *Puccinia Ludwigii* Tepper, n. sp. — V. von Borbás, 'Bemerkungen zu Neuman's "Violæ Sueciæ exsiccatæ."' —(No. 29). R. Gutwinski, 'Zur Wahrung der Priorität.'

Bot. Zeitung (Nos. 25, 26). — 'Beiträge zur Kenntniss des Malvaceen-Andrœceums.' — (No. 27). A. Scherffel, 'Zur Frage: Sind die den Höhlenwänden aufsitzenden Fäden in den Rhizomschuppen von *Lathræa Squamaria* secrete oder Bacterien?'—(No. 28). L. Jost, 'Die Zerklüftungen einiger Rhizome und Wurzeln' (1 plate). — O. Foerster 'Ueber Vorkommen mit einander verwachsener Körner von *Hordeum vulgare*.'

Bull. Soc. Bot. France (xxxvii. Comptes-rendus, i. May 1).—O. Lignier, 'Décortication des tiges de Calycanthées, de Mélastomacées, et de Myrtacées.' — A. Le Grand, 'Contribution à la flore de la Corse.'—P. A. Genty, '*Pyrola media* Sw.'—V. Payot, 'Sur la végétation de la région des neiges.'—E. Mer, 'Une maladie nouvelle des rameaux de Sapin.'—(Comptes-rendus, ii. June 1). B. Martin, 'Florula du cours supérier de la Dourbie.' — A. Le Grand, 'Sur le *Bupleurum glaucum*.' — G. Chastaignt, 'Variabilité des charactères morphologiques de quelques formes de Rosiers.' — E. Malinvaud, 'Un mot sur l'utilité des expériences de culture pour la vérification des espèces dans les genres critiques.'— —. Hue, 'Les *Pertusaria* de la flore française.' — J. De Seynes, 'De la distribution des *Ceriomyces* dans la classification des Polypores.'

Bull. Torrey Bot. Club (June). — G. N. Best, 'On the group *Cinnamomeæ* of N. American Roses.'—M. S. Bebb, 'White Mountain Willows.' — B. D. Halsted, 'Zygodesmus.' — W. J. Beal, *Melica argentea* and *M. micrantha*.

Gardeners' Chronicle (June 28). — *Ephedra altissima* (fig. 129).— R. A. Rolfe, '*Dendrocalamus sikkimensis*' (fig. 130). — (July 5). *Moorea* (gen. nov. *Orchidearum*) *irrorata* Rolfe.—*Iris Gatesii* (fig. 3). —(July 12). *Alocasia reversa* N. E. Br., n. sp. — C. B. Plowright, 'British *Uredineæ*.'

Midland Naturalist (July). — G. C. Druce, 'A Tour through Spain.'—W. Mathews, 'County Botany of Worcester.'

Nuovo Giornale Bot. Italiano (July 1).—C. Rossetti, 'Epaticologia della Toscana nord-ovest.'—P, Baccarini, 'Primo catalogo di Funghi dell'Avellinese.'—S. Sommier, 'Nuove stazione di piante in Toscana.'—Id., 'Sulla *Lonicera cærulea*.'—A. Terracciano, 'La flora delle isole Tremiti.' — Id.' 'La flore del Polesine.'—Id., 'Le piante dei dintorni di Rovigo.'—O. Kruch, 'Istologia ed istogenia del fascio conduttore nelle foglie di *Isoetes*.' — Id., 'Sulla struttura e lo sviluppo del fusto della *Dahlia imperialis.*'—A. Borzi, 'Stadii anamorfici di alcune Alghe verdi,'—A. Goiran, 'Sopra diverse forme appartenenti ai generi *Scolopendrium*, *Crocus*, *Acer*, *Ulmus*, *Linaria.*'—G. Arcangeli, 'Sulla struttura delle foglie dell' *Atriplex nummularia* Lind., in relazione alla assimilazione.'—Id., 'Sulle foglie delle piante acquatiche especialmente sopra quelle della *Nymphæa* e del *Nuphar.*'—Id., 'Sull' *Helicodiceros muscivorus.*'—A. Poli, 'Alcune osservazioni sul' reagente di Millon.'—U. Martelli, 'Un caso di dissociazione naturale nei Licheni.'—Id., 'Sulla *Torula spongicola.*'—C. Grilli, 'Di alcuni Licheni marchigiani.'—T. Caruel. 'Un piccolo contributo alla flora Abissina.'—C. Massalongo, 'Intorno ad un nuovo tipo di *Phytoptocecidio* del *Juniperus communis.*'

Oesterr. Bot. Zeitschrift (July).—L. Celakovsky, '*Petasites Kablikianus.*'—P. Ascherson, '*Carex refracta* Willd. (1805) = *C. tenax* Reut. (1856).'—U. Dammer, 'Die extrafloralen Nectarien am *Sambucus nigra.*'—F. Dalla Torre, '*Juniperus Sabina* in den nördlichen Kalkalpen Tirols.'—J. Freyn, 'Plantæ Karoanæ.'

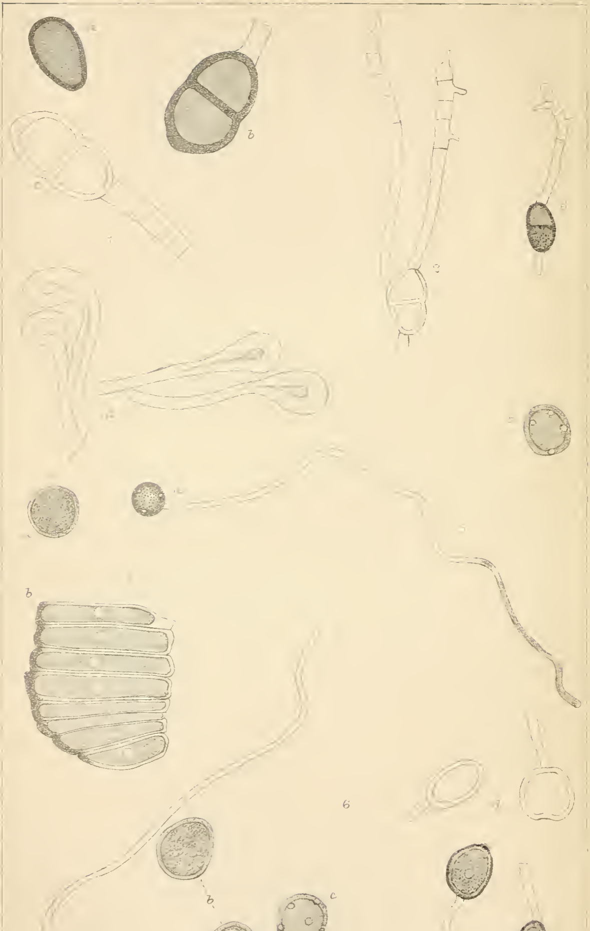
Proc. Royal Irish Academy (3 S. i. 3: June).—H. W. Lett, 'Mosses, Hepatics, and Lichens of Mourne Mountains.'—S. A. Stewart, 'Botany of South Clare and the Shannon.'

Scottish Naturalist (July).—F. B. White, 'Flora of River-shingles.'—Id., 'Variety of *Cardamine amara.*'—W. H. Beeby, '*Rumex propinquus*' in Shetland.'—J. Keith, '*Agaricus storea.*' J. W. H. Trail, 'Revision of *Uredineæ* and *Ustilagineæ* of Scotland.'

LINNEAN SOCIETY OF LONDON.

June 19, 1890.—Prof. Charles Stewart, President, in the chair. Messrs. W. Cross and S. Schönland were elected Fellows of the Society.—Mr. W. H. Beeby exhibited a specimen of *Rumex propinquus* new to Britain, and procured in Shetland.—Mr. Thomas Christy exhibited and made remarks upon a specimen of *Callistemon rigidum.*—Mr. E. M. Holmes exhibited some marine Algæ new to Britain, including *Ascocyclus reptans*, *Halothrix lumbricalis*, *Harveyella mirabilis*, *Sorocarpus uræformis*, and *Vaucheria litorea;* also a specimen of *Rhodymenia palmata* with antheridia, which has not been previously recorded to occur in this state in Great Britain.—A paper "On the vertical distribution of Plants in the Caucasus," by Dr. Gustav Raddes, was read.

We regret to announce the death of John Ralfs, which occurred at Penzance on the 14th ult. We hope to give a memoir of the veteran botanist in our next issue.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Rusts and Mildews of India

ON SOME RUSTS AND MILDEWS IN INDIA.

By A. Barclay, M.B., Bengal Medical Service.

(Plate 298).

It is somewhat remarkable, considering the economic importance of the subject, that no systematic study of the Rusts and Mildews of our cereal crops in India has ever been undertaken. The following notes on some of these may therefore be of interest; for although this paper contains nothing absolutely new to science, an accurate record of the occurrence of these fungi in India must be interesting to the student of geographical distribution, and to scientific agriculturists.

In a recent paper submitted to the Asiatic Society of Bengal, I recorded some observations on the prevalence and characters of Rust and Mildew on wheat, and I have therefore excluded this from the present paper. This latter subject is one of the greatest importance; but our information concerning its life-history is still so meagre and incomplete, that it is premature to enter upon it. I will only note here that, so far as I have been able to gather, the most prevalent form of Rust on wheat, barley, and oats in India is *Puccinia Rubigo-vera* DC., and not *P. graminis* Pers. And this is true even of the outer Himalayan region, where Rust is very prevalent, and where three species of barberry are common (*B. Lycium* Royle, *B. aristata* DC., *B. vulgaris* L.), one of which, *B. Lycium*, bears an Æcidium abundantly. At the same time I have never been able to find an Æcidium on any species of Boragineæ in the Himalayan region, and none is known on the plains. Whilst *P. Rubigo-vera* is apparently by far the commonest Rust in India, *P. graminis* is not wholly unknown. I have received specimens of *P. graminis* from Jeypore, about 200 miles in a direct line from the nearest known habitat of barberry; but I have never seen a specimen on the crops actually in the neighbourhood of Æcidium-bearing barberry. These facts are sufficient to show the mystery in which the subject here is involved, and that it needs much more study before anything useful can be written on it.

The fungus on *Linum* ("Ulsee") is apparently extremely common over large areas of the plains. It is often so closely concurrent with Rust on wheat and barley, that the uredo stage on *Linum* has often been supposed to be the cause of the Rust on wheat. This supposition, however, cannot be entertained, with our present knowledge, by botanists. The fungus on *Linum* is probably a complete autœcious species.

With these few introductory remarks I pass on to a description of the Rusts with which I am acquainted in India, other than those on wheat, barley, and oats.

Puccinia Sorghi Schw. on *Sorghum vulgare* Pers. ("Jowari").

Through the kindness of Mr. J. A. Baines, C.S., I obtained some specimens of rusted Sorghum from the Bombay Presidency.

These were collected at the end of the winter 1889–90. "Jowari" is usually a hot-weather ("kharif") crop; but a cold-weather, or "rabi," crop is grown in some parts. The specimens of the fungus I obtained were from the Poona Farm on "Shalu," a cold-weather Jowari. The leaves were spotted irregularly on both sides with oval reddish-brown spots, black in the centre. The black central parts of the spots were teleutospore pustules, and these, though really naked, were overlapped by the raised and rent epidermis.

On examining some spores scraped from these pustules they were found to consist mainly of *Puccinia* spores with some uredospores.

The uredospores are brown, oval bodies, with the place of attachment to the stalk usually clearly marked. After lying twenty-four hours in water they measured 34–30 × 22–20 μ. The epispore is beset with shallow warts, and pierced by 4 to 5 germ-pores on the short equator of the spore. They did not germinate (fig. 1*a*.)

The teleutospores are deep brown and usually rounded at both ends (fig. 1*b*. *c*.), though some are slightly narrowed towards the apex. They are slightly constricted at the septum, and a piece of stalk remains adherent. They are therefore rather firmly adherent to the host. The epispore is uniformly thick and quite smooth. After lying twenty-four hours in water they measured 50–41 × 29–22 μ.

Among the scraped-off uredo and teleutospores are numerous large capitate or club-shaped paraphyses; some of these are colourless, whilst others are deep brown (fig. 1, *d*.).

After lying in water three days (24 × 3 hours) many germinated in the usual way, the promycelia being colourless. The sporidia are abstricted from long sterigmata; they are colourless and oval, measuring 15 × 10 μ (figs. 2, 3).

Remarks.—This affection, known locally as "Kani," is possibly *P. Sorghi* Schweinitz, and I have named it so provisionally, but it is quite possibly a new species. I am the more inclined to think it is a new species, because I have never seen nor received specimens on Zea Mays in India; and as the latter is very extensively cultivated, this is unexpected on the assumption that the fungus is *P. Sorghi*. Still, as I have not had good opportunities for obtaining information about the existence of any Rust on Zea, it is quite possible that it exists. Assuming the fungus on Sorghum to be *P. Sorghum*, the Indian species differs especially in having considerably larger uredo and teleutospores; in the teleutospores not being thickened at the free ends; and in the spores being associated with paraphyses. The differences in the spore measurements are best shown tabularly—

	India.	Schröter.*	Saccardo.†
Uredospores	34-30 × 22-20	28-24 × 24-22	30-23 × 26-22
Teleutospores	50-41 × 29-22	44-33 × 17-14	45-28 × 17-12

* 'Die Pilze Schlesiens.' † 'Sylloge Fungorum.'

Schröter describes the uredospores as having three to four germ-pores, and notes that the apex of the teleutospore is thickened to 5–6 μ. Saccardo states that the teleutospore pustules are without paraphyses, whilst the absence of any reference to them throughout Schröter's description leads to the conclusion that the European species is entirely without them. The fungus has a very wide distribution. Thus, in Saccardo's 'Sylloge' it is recorded in Italy, France, Germany, North and South America, and South Africa.

MELAMPSORA LINI Pers., on *Linum usitatissimum* L. ("Ulsee").

I obtained excellent specimens of a species of *Melampsora*, gathered on the 4th April, 1890, at Dumraon, N. W. Provinces. The leaves were very extensively attackedwith orange-red pustules, oval to round, but coalescing freely, and often involving most of the leaf-surface. These pustules are mostly epiphyllous, and they are often surrounded by a wall of epidermis giving them the appearance of the æcidial fructification of *Phragmidium*. In other parts dark crusts might be seen which were the teleutospore beds.

The uredospores are pale orange-red, and are accompanied by colourless capitate paraphyses, sometimes of very large size, the head exceeding the spores in diameter. They are round (fig. 4, *a*) to oval, and the dried spores, when just immersed in water, measured 21–18 × 18–16 μ. But after lying forty-eight hours in water, most spores become spherical, measuring 24 to 21 μ. in diameter. The epispore is sparsely beset with spines. I could not ascertain the number of germ-pores. The paraphyses had heads measuring 30–28 × 20 μ.

The teleutospores are long, cylindrical, or prismatic single-celled bodies, very firmly adherent to one another laterally (fig. 4, *b*). They each exhibit a central nuclear space, and measured, after lying forty-eight hours in water, 54–56 × 10–9 μ. They did not germinate after lying some days in water even up to June, and I conclude a period of rest is necessary before this can take place.

Remarks.—This is no doubt *Melampsora Lini* Pers. The spore measurements of the Indian species are compared with the statements of European authorities in the following table :—

	India.	Schröter.	Saccardo.	Winter.
Uredospores	21-18 × 18-16	22-15 × 16-14	24-15 × 18-14	24-16 × 17-14
Teleutospores	54-50 × 10-9	45 × 20	60-15 × 20-17	44 × 18
Paraphyses	30-28 × 20	20 × 17		

On this it need only be remarked that the Indian variety has much narrower spores than the European, and that it has also large-headed paraphyses. These differences are not, however, important. Taking some grains from extensively attacked plants, I found that twenty-eight of them weighed against twenty sound grains. The fungus has a very wide distribution. Saccardo records it in Italy, Dalmatia, Britain, France, Austria, Switzerland, Germany, Hungary, Bohemia, Norway, Russia, Belgium, Asiatic Siberia, and North Africa.

Uromyces Pisi Pers. ? on *Cicer arietinum* L, (" Channa ").

I obtained some good specimens of a fungus on this host, also from Dumraon, gathered on 4th April. There were small circular or oval brownish pustules on the leaflets, with a tendency to coalescence. They were both epi- and hypophyllous, though apparently more often hypophyllous.

The uredospores are brownish red, mostly spherical, sparsely covered with spines, and each apparently with four germ-pores (fig. 5). The dry spores, just immersed in water, measured 25–20 × 21–20 μ. I placed some of these spores in water on the 2nd May, and they germinated freely in twenty-four hours, throwing out a long, simple, unbranched tube, quite colourless (fig. 5, *a.*). This germination a month after gathering is noteworthy. I could find no teleutospores in the specimens gathered, and as these were full-grown and ready to reap, I conclude none are formed.

Remarks.—This may be *Uredo Ciceris-arietini* Grogn.; but the only reference available to me is that in Saccardo's 'Sylloge In this book it is said to be found on the leaves of the same host in the Saone and Loire provinces of France. In a recent article by Schröter, on the Fungi of Servia,* he notes a uredo on *Cicer* Fungorum,' and here no description or measurements are given. *arietinum*, but includes it under *Uromyces Pisi* Pers. Saccardo records the fungus in Italy, Sicily, France, Belgium, Britain, Austria, Germany, Bohemia, Switzerland, and Asiatic Siberia.

Uromyces Pisi Pers. on *Lathyrus sativus* L. (" Khesari ").

From Dumraon I obtained specimens also of this plant bearing a *Uromyces*, gathered on 4th April. There were numerous dark pustules, round to oval or broadly linear, on the stem mostly, but also on the leaves. On the latter they are apparently amphigenous. The pustules contained both uredo- and teleutospores, the latter in excess.

The uredospores are orange-red, with a tendency to brownish. They are oval for the most part, spiny, and with five to six germpores (fig. 6, *c.*). The dried spores just immersed in water measure 28–23 × 22–20 μ. These spores, after lying twenty-four hours in water, had germinated freely, throwing out a single, long, unbranched tube, at the distal end of which were collected the pale reddish brown contents, leaving the empty spore-case dingy yellow (fig. 6, *a*). The spores now measured 25–21 × 24–21 μ. I observed the uredospores germinating even as late as the middle of June, *i. e.*, more than two months after they were gathered.

The teleutospores are more or less oval and chestnut-brown, but vary considerably in size and shape (fig. 6, *d*). A nuclear space and germ-pore at the apex are clearly visible. The epispore is very finely tuberculated, and not thickened anywhere as a rule, though occasionally a slight thickening at the apex is observable. A piece of stalk usually adheres to the spore. After lying some hours in water the spores measured 32–23 × 19–14 μ. They refused to germinate, apparently requiring a long period of rest.

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* 'Hedwigia,' Band xxix. Heft 2, 1890.

Remarks.—Four species of *Uromyces* are recorded in Saccardo's 'Sylloge Fungorum,' on species of *Lathyrus*, namely, *U. Fabæ* Pers., *U. Pisi* Pers., *U. Lathyrinus* Speg., and *U. polymorphus* P. & C. The Indian species corresponds fairly closely with *U. Pisi*, and may, at any rate provisionally, be classed with it. At the same time no Æcidium on any species of *Euphorbia* is yet known in the plains of India, though such might be found on search. In the description of the fungus on *Cicer arietinum* mention was made of Schröter's article on "Servian Fungi," and I observe that he includes a *Uredo* and *Uromyces* on *Lathyrus latifolius* also under *U. Pisi;* in other words, the two fungi on *Cicer* and *Lathyrus* are, according to him, identical. The characters of the uredospores, as I have described them above, agree closely enough to warrant the assumption that they are identical, the only difference being that whilst I could find only four germ-pores in the uredospores from *Cicer* I found five to six in those from *Lathyrus*. But this point is difficult to be very certain about.

PUCCINIA FAGOPYRI Barclay, on *Fagopyrum esculentum* Moench ("Phapra," "Ogra," "Kathu").

I have described this fungus elsewhere,* but my knowledge is imperfect. I found plants very largely attacked in October, the leaves bearing immense numbers of black and brown pustules all hypophyllous. The brown pustules contained uredospores, which are pale brown, echinulate, oval, 23 × 18 μ. on an average. When placed in water they germinate in the usual way. The black pustules contained teleutospores, which are deciduous, with a small fragment of stalk adhering to the detached spore. They are dark brown, very variable in size and shape, slightly constricted at the septum, smooth on the surface, slightly thickened at the apex, and measuring 36–25 × 13–11 μ. The upper cell is often much broader than the lower, and is more or less globular. The apical thickening measures 4 μ., whilst the rest of the cell-wall is 2 μ.

DESCRIPTION OF THE PLATE.—1, *P. Sorghi ?: a*, uredospore, × 350; *b, c*, teleutospores, × 350; *d*, paraphyses, × 350. 2. *P. Sorghi ?:* germinated teleutospore. 3. Ditto, × 150. 4. *Melampsora Lini: a*, uredospore, × 350; *b*, teleutospore, × 350. 5, *Uromyces Pisi ?* on *Cicer: a*, germinated uredospore, × 220; *b*, ditto, 350 × 220. *Uromyces Pisi*, on *Lathyrus: a*, germinated uredospore, × 220; *b*, ungerminated uredospore, × 350; *c*, germinated uredospore, showing germ-pores, × 350; *d*, teleutospores, × 350.

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* 'Journal of the Asiatic Society of Bengal,' vol. lix. pt. 2, No. 2, 1890.

TONQUIN FERNS.

By J. G. Baker, F.R.S.

Monsieur B. Balansa, so well and honourably known as a collector in Asia Minor and Paraguay, has been engaged, during the four years between 1885 and 1889, in exploring Tonquin. His collections are very extensive, and as next to nothing has been known previously about the Botany of that region, they are of great interest. The general superintendence of their elaboration systematically has been entrusted by M. Bureau to M. Drake del Castillo, and papers have already appeared in the French journals on the Cupuliferæ, Grasses, and Mosses. In the present paper I propose to enumerate all the species contained in our Kew List of the Vascular Cryptogamia, and to describe the novelties. The numbers given with each species are Balansa's distribution numbers, and those in brackets indicate the position of the new species according to our 'Synopsis Filicum.'

1858. *Cyathæa spinulosa* Wall. ?

31, 33. *Alsophila podophylla* Hook.

(58*), 1803, 1861. **Alsophila rheosara**, n. sp.—Trunk a yard high. Fronds ample, deltoid, bipinnate, moderately firm in texture, green and glabrous on both surfaces; rachises brown, without either paleæ or prickles. Pinnæ oblong-lanceolate, reaching a length of $1\frac{1}{2}$–2 ft. and a breadth of 7–8 in. Pinnules lanceolate, deeply crenate, $\frac{5}{8}$–$\frac{3}{4}$ in. broad, truncate at the base, the lower distinctly petiolated. Main veins $\frac{1}{8}$ in. apart; veinlets simple, ascending, 4–5-jugate. Sori crowded, placed close to the main veins in rows that fall short of the edge of the pinnules.—Allied to *A. glabra* and *A. podophylla*.

1909. *Hymenophyllum polyanthos* Sw.

1907. *H. dilatatum* Sw.

(56*), 1905. **Hymenophyllum oxyodon**, n. sp.—Rhizome very slender, wide-creeping. Stipe very short. Frond oblong, bipinnatifid, glabrous, about an inch long; main rachis winged throughout; primary segments crowded, the upper simple, erecto-patent, the lower compound, with a few short crowded linear secondary segments, the margin everywhere conspicuously toothed. Sori several in a frond, terminal or lateral on the upper segments. Valves of the indusium ovate, serrated.—Mountains at an altitude of nearly 4000 ft. Allied to *H. Tunbridgense* and *barbatum*.

172, 1899. *Trichomanes parvulum* Poir.

194, 1901. *T. auriculatum* Blume.

1906, 1908. *T. Pilicula* Bary.

1900. *T. radicans* Sw., var.

1873. *Davallia solida* Sw.

1877. *D. divaricata* Blume.

119, 120, 1801. *D. Hookeriana* Wall.

(50*), 118. **Davallia** (Microlepia) **phanerophlebia**, n. sp.—Rhizome creeping, $\frac{1}{8}$ in. thick, clothed with minute brown hair-like paleæ. Stipe naked, a foot long. Frond oblong, simply pinnate, 1½–2 ft. long, 4–5 in. broad, moderately firm in texture, green on both surfaces, glabrous except on the midrib of the pinnæ. Pinnæ very numerous, sessile, lanceolate, subentire; central 2–2½ in. long, ½ in. broad; lower gradually shorter. Veins very distinct, erecto-patent, forked. Sori very numerous, submarginal, terminal on the veins. Indusium semiorbicular, glabrous. — Near *D. Hookeriana.*

1790. *D. marginalis* Baker.
46. „ var. *D. calvescens* Wall.
1016. *D. rhomboidea* Wall.
73, 79, 1874, 1875. *D. Speluncæ* Baker, forms.
40, 105. *D. tenuifolia* Sw.
122, 125, 1954, 1972. *Lindsaya flabellulata* Dryand.
1962. *Adiantum lunulatum* Burm.

134, 1964. **Adiantum Balansæ**, n. sp. — Rootstock erect. Stipes tufted, castaneous, ½ ft. long, with a few small brown linear paleæ towards the base. Frond lanceolate, simply pinnate, a foot long, above 2 in. broad, moderately firm in texture, bright green and glabrous on both surfaces; rachis and petioles narrowly winged. Pinnæ quadrate, the lower deflexed, the upper spreading horizontally, the largest ¾ in. broad, entire on the lower and inflexed inner margin, slightly toothed and soriferous on the upper and outer. Veins fine, flabellate. Sori numerous, 1-12th to 1-8th in. long. Indusium narrow, glabrous. — Near *A. Mettenii* Kuhn. In 1964 the pinnæ are smaller, thinner, and more deeply toothed than in 134, but it is doubtless another form of the same species.

135, 1957, 1958. *A. caudatum* L.
1966. *A. Capillus-veneris* L.
133, 1953. *A. flabellulatum* L.
129. *Cheilanthes mysurensis* Wall.
126. *C. tenuifolia* Sw.
57. *Pellæa nitidula* Baker.
111, 113, 1969. *Pteris longifolia* L.
107, 1955. *P. cretica* L., forms.

(16*), 1970. **Pteris dissitifolia**, n. sp. — Stipe pale brown, naked, 1½–2 ft. long. Frond subdeltoid, bipinnate, 1½ ft. long, a foot broad, green on both surfaces, glabrous. Pinnæ few, lanceolate, erecto-patent, the lowest the largest, forked at the base, their rachises winged throughout; final segments distant, lanceolate, ascending, ¼ in. broad, the lower 2–3 in. long, decurrent at the base. Veins distinct, erecto-patent, deeply forked. Sori continuous along both margins of the segments and their decurrent bases. Indusium narrow, glabrous.—Allied to *P. longipinnula* Wall.

54. *P. quadriaurita* Retz., var. *P. aspericaulis* Wall.
1978. *P. Grevilleana* Wall.
60. *P. biaurita* L.
1959. *P. incisa* Thunb., var. *P. aurita* Blume.
1884. *Lomaria adnata* Blume.
141. *Blechnum orientale* L.
175, 1974. *Ceratopteris thalictroides* Brong.
69. *Asplenium nidus* L.

68. *A. Phyllitidis* D. Don.

(17*), 1919. **Asplenium melanolepis,** n. sp.—Stipes densely tufted, 1–2 in. long, clothed with copious small linear dark brown paleæ. Frond simple, entire, lanceolate, a foot long, under 2 in. broad at the middle, narrowed gradually to both ends, very acute, moderately firm in texture, green and glabrous on both surfaces. Veins lax, erecto-patent, forked. Sori medial, parallel, $\frac{1}{8}$–$\frac{1}{6}$ in. apart, distant from both margin and midrib. Indusium narrow, glabrous.—Near *A. serratum* L.

1914, 1915. *A. Griffithianum* Wall.

1832. *A. normale* Don.

1850. *A. tenerum* Forst.

98. *A. falcatum* Lam.

99. *A. dimidiatum* Sw., var. *A. comptum* Hance.

95, 1830, 1831. *A. resedum* Smith.

1956. *A. heterocarpum* Wall.

97. *A. laserpitiifolium* Lam.

116, 1851. *A. Belangeri* Kunze.

1852. *A. nitæfolium* Kunze.

76. *A. umbrosum* J. Sm.

67, 1920. *A. lanceum* Thunb.

(209*), 1833. **Asplenium** (Diplazium) **lepidorachis,** n. sp.—Stipes tufted, 4–5 in. long, rough up to the top with minute paleæ. Frond oblong-lanceolate, simply pinnate, 1–$1\frac{1}{2}$ ft. long, 3–4 in. broad, membranous, bright green and glabrous on both surfaces, minutely scaly on the rachis and midrib. Pinnæ sessile, lanceolate, 20–30-jugate, $1\frac{1}{2}$–2 in. long, $\frac{1}{3}$ in. broad, subentire, minutely auricled on the upper side at the base. Veins lax, very distinct, usually forked. Sori $\frac{1}{8}$–$\frac{1}{6}$ in. long, running up from the midrib more than half-way to the margin. Indusium broad, glabrous.—Near *A. Seemanni* Baker.

(216*), 1836, 1846. **Asplenium** (Diplazium) **megaphyllum,** n. sp. — Stipes $1\frac{1}{2}$ ft. long, thinly paleaceous throughout; paleæ linear, dark brown. Frond oblong, simply pinnate, 2–$2\frac{1}{2}$ ft. long, a foot broad, moderately firm in texture, green and glabrous on both surfaces; rachis brown. Pinnæ lanceolate, subsessile, the largest 8–9 in. long, 2 in. broad, with shallow rounded lobes and a subtruncate base. Veins pinnate, opposite the lobes; veinlets 5–6-jugate, very ascending. Sori narrow, beginning at the base of the veinlets. Indusium narrow, glabrous. — Near *A. celtidifolium* Kunze.

35, 96, 1835. *A. sylvaticum* Presl.

1842. *A. japonicum* Thunb.

1843, 1844, 1839. *A. latifolium* Don.

104. *A. bantamense* Baker,

93, 1845. *A. esculentum* Presl.

(275*), 1847. **Asplenium** (Anisagonium) **platyphyllum,** n. sp. —Stipe dull brown, naked, above a foot long. Frond deltoid, bipinnate, 2 ft. long, thin, green and glabrous on both surfaces; rachises brown, naked. Lower pinnæ (two pairs) oblong-lanceolate, nearly a foot long, with distinct sessile oblong pinnules an inch broad. Veins pinnate, with 3–4-jugate veinlets, anastomosing as in *Eunephrodium* in the outer half of the pinnules. Sori linear, beginning at the base of the veinlets, the lower ½ in. long. Indusium very narrow, glabrous. — Habit of South American *A. costale* Sw., but veins united.

1821. *Aspidium aculeatum* Sw.

1818. *A. laserpitiifolium* Mett.

1849. *A. falcatum* Sw.

38, 1795, 1820. *Nephrodium Filix-mas* Rich.

23, 24, 1863. *N. syrmaticum* Baker.

75, 1939. *N. odoratum* Baker.

72. *N. setigerum* Baker.

1791, 1802, *bis*. *N. dissectum* Desv.

(138*), 1815. **Nephrodium** (Lastrea) **obovatum**, n. sp.—Stipe a foot long, slightly scaly; paleæ firm, lanceolate, nearly black, with a pale brown edge. Frond oblong-deltoid, decompound, thin, glabrous, 1½–2 ft. long. Lower pinnæ the largest, produced on the lower side; central oblong-lanceolate, with lanceolate pinnules cut down to the rachis. Final segments obovate or oblong, obtuse, ⅛–⅙ in. broad. Veins pinnate in the final segments; veinlets very ascending. Sori medial on the veins. Indusium small, fugacious.—Near *N. catopteron* Hook.

(145*), 1836. **Nephrodium** (Lastrea) **setulosum**, n. sp.—Frond ample, deltoid, bipinnatifid, moderately firm in texture, green on both surfaces, setulose on the ribs beneath; rachises dull brown, not paleaceous. Lower pinnæ oblong-lanceolate, a foot or more long. Pinnules sessile, lanceolate, 3–4 in. long, an inch broad, the lowest cut down to a narrow wing into linear-oblong tertiary segments, ⅛–⅙ in. broad. Veinlets 8–9-jugate in the tertiary segments, simple or forked. Sori placed midway between the midrib and margin, a dozen or more in the lower tertiary segments. Indusium small, reniform, persistent.

26, 1805, 1806. *N. Leuzeanum* Hook.

51. *N. pennigerum* Hook?—Pinnæ like those of *pennigerum*, but rootstock wide-creeping.—May be a distinct new species.

1864. *N. truncatum* Presl.

(202*), 1947, 1948. **Nephrodium** (Sagenia) **quinquefidum**, n. sp.—Stipes tufted, 1½ ft. long, naked upwards, bearing many lanceolate brown paleæ in the lower third. Frond thin, deltoid, quinquefid, ½–1 ft. long, nearly or quite as broad as long; central segment oblong, acute, 2½–3 in. broad, irregularly repand; lower pair of segments quite distinct from the end one, sessile, deeply forked on the lower side at the base. Main veins parallel, arcuate, about half an inch apart, with numerous cross veinlets like those of a *Camhyloneuron*, and copious small areolæ. Sori copious, minute, various in form, very dense, often confluent. Indusium minute, fugacious.—Near *N. ternatum* Baker.

(212*), 1857. **Nephrodium** (Sagenia) **stenopteron**, n. sp.—Stipe brown, reaching a length of 1½–2 ft., clothed towards the base with copious large linear brown membranous paleæ. Frond oblong-deltoid, membranous, green and glabrous on both surfaces, 1½–2 ft.

long, about a foot broad, bipinnatifid, with a broad wing to the main rachis reaching nearly or quite down to the base. Lower pinnæ the largest, deltoid, much produced on the lower side; central pinnæ lanceolate, equilateral, $1\frac{1}{2}$–2 in. broad, deeply pinnatifid, with ovate or ovate-lanceolate arcuate secondary segments. Veins anastomosing copiously in hexagonal areolæ. Sori copious, scattered, minute, irregular in form. Indusium minute, glabrous, fugacious.—In habit between *cicutarium* and *decurrens.*

87. *N. variolosum* Baker.

53. *N. decurrens* Baker.

21, 49, 82, 85, 1800. *N. cicutarium* Baker, forms.

37. *Nephrolepis cordifolia* Presl.

43. *N. exaltata* Schott.

1809, 1810. *N. acuta* Presl.

1823. *N. ramosa* Moore.

149. *Oleandra Cumingii* J. Smith.

1868. *Polypodium punctatum* Thunb.

1885. *P. urophyllum* Wall, var. *uniseriale.*—Sori uniserial between the main veins.

(64*), 47. **Polypodium** (Goniopteris) **megacuspe,** n. sp.—Rootstock wide-creeping, $\frac{1}{8}$ in. diam.; paleæ small, lanceolate, dense, membranous, brown. Stipes distant, naked, stramineous, 15–18 in. long. Frond oblong, simply pinnate, a foot long, half as broad, thin, green and glabrous on both surfaces; rachis naked, stramineous. Pinnæ about 11, sessile, entire, oblong, with a very large cusp, 4–5 in. long, $1\frac{1}{4}$–$1\frac{1}{2}$ in. broad. Main veins arcuate, very distinct, parallel. about $\frac{1}{8}$ in. apart. Sori 10–12 between the midrib and margin, uniserial between the main veins.—Near *P. urophyllum.*

1878. *P. subdigitatum* Blume.

1822. *P. amœnum* Wall.

1936. *P. rostratum* Hook.

1935. *P. superficiale* Blume.

(305*), 148. **Polypodium** (Phymatodes) **tonkinense,** n. sp.—Rootstock slender, short-creeping; paleæ lanceolate, dark brown. Stipes scarcely any. Frond oblanceolate, subcoriaceous, glabrous, entire, 5–6 in. long, under an inch broad above the middle, narrowed thence gradually to the base. Veins in copious hexagonal areolæ with free included veinlets. Sori copious, scattered irregularly, confined to the upper half or third of the frond.—Near the Philippine *P. tenuilose,* Kunze.

1926. *P. membranaceum* Don.

1949. *P. Phymatodes* L.

1880. *P. dilatatum* Wall.

140. *P. Fortunei* Kunze.

161, 162. *P. adnascens* Sw.

1931, 1933. *P. varium* (Blume).

1930. *P. floccigerum* Mett.

156, 157. *P. acrostichoides* Forst.

1882. *Gymnogramme javanica* Blume.

65, 66. *G. Wrightii* Hook.

36, 100, 101, 1872. *G. elliptica* Baker.

(81*), 1870. **Gymnogramme (Selliguea) longisora**, n. sp.—Rootstock slender, wide-creeping. Stipe slender, naked, a foot long. Frond oblong, simply pinnate, membranous, green and glabrous on both surfaces, a foot long, 6–8 in. broad. Pinnæ about 9, oblong-lanceolate, acute, entire, 3–5 in. long, 1–1¼ in. broad at the middle, the upper sessile, the lower areolæ many, with free included veinlets. Sori linear erecto-patent, parallel, about ⅛ in. apart, reaching all the way from the midrib to the margin.—Nearly allied to *G. elliptica.*

(81*), 102. **Gymnogramme (Selliguea) digitata**, n. sp.—Rootstock wide-creeping, hypogœous, ⅛ in. diam. Stipes remote, naked, stiffly erect, a foot or more long. Frond deltoid, membranous, glabrous, 6–9 in. long and broad, cut down nearly to the base into five entire lanceolate acuminate segments, about half a foot long, and an inch broad. Sori linear, erecto-patent, parallel. produced from the midrib nearly to the margin. Veining of *G. elliptica.*—Near *G. elliptica* and *palmata.*

1923, *bis.* *Vittaria lineata* Sw.

1922. *V. elongata* Sw.

(1*), 1921. **Antrophyum vittarioides**, n. sp.—Stipes tufted, very short; paleæ lanceolate, nearly black. Frond linear, entire, moderately firm in texture, green and glabrous on both surfaces, ½ ft. long, ¼–⅓ in. broad at the middle, narrowed gradually to the base and apex. Veins forming long narrow areolæ parallel with the midrib and margin, without any free included veinlets. Sori distinctly intramarginal, sunk in a distinct groove, forming sometimes a double row.—Stands just on the line of boundary between *Vittaria* and *Antrophyum.*

1925. *A. reticulatum* Kaulf.

63, 1894. *Meniscium simplex* Sw.

62, 1895. *M. triphyllum* Sw.

159. *Drymoglossum subcordatum* Fée.

1934. ,, ,, a small form of var. *obvatum.*

1967. *Acrostichum quercifolium* Retz.

1891. *A. appendiculatum* Willd.

1893. *A. variabile* Hook.

1887. *A. subrepandum* Hook., type; and 1886, an abnormal form with sori as in *Meniscium deltigerum* Wall., which is an abnormal form of *A. virens.*

137, 1977. *Osmunda javanica* Blume.

169. *Lygodium japonicum* Sw.

171. *L. dichotomum* Sw.

170. *L. scandens* Sw.

168. *L. polystachyum* Wall.

174. *Schizæa dichotoma* Sw.

166, 1943. *Angiopteris evecta* Hoffm.

1985. *Lycopodium carinatum* Desv.

1990. *Selaginella plumosa* Baker.

6. *S. Wallichii* Spring.

9, 19. *S. caulescens* Spring.

1992. *S. flabellata* Spring.

1994. *S. canaliculata* Baker.

14, 986, 987. *S. proniflora* Baker.

(318*), 1997. **Selaginella** (HETEROSTACHYS) **tonkinensis**, n, sp. —Stem fugacious, ascending, $\frac{1}{2}$–1 ft. long, copiously branched, lower leafy; branches above $\frac{1}{3}$ in. broad. Leaves of lower plane membranous, ovate-lanceolate, very obtuse, contiguous on the branchlets, $\frac{1}{6}$ in. long, much rounded on the upper side at the base; those of the upper plane ovate-lanceolate, with a large cusp. Spikes copious, reaching an inch in length; of the lower plane, ovate, of the upper plane twice as long, green, ovate-lanceolate.—Habit of *S. atroviridis.*

4078. *Isoetes coromandelina* L. fil.

1982. *Equisetum debile* Roxb.

CAMPANULARUM NOVARUM DECAS PRIMA

AUCTORE H. FEER.

1. **Campanula erucifolia** (ex affinitate *C. laciniatæ* L). Lanuginoso-hirsuta. Caules 1–2 (pumili vel 15–20 cm. alti, 2–3 mm. crassi) pauciflori. Folia profunde et regulariter laciniato-lyrata laciniis distantibus; radicalia ovato-oblonga in lacinias ovato-lanceolatas ad $\frac{3}{4}$ fissa; caulina lanceolata laciniis sublinearibus. Flores breviter pedunculati, ut in *C. laciniatâ* magni. Calix tomentosus; lobi triangulares acuti, corollâ $\frac{1}{3}$–3-plo breviores, erecti; appendices ovato-rotundatæ. Corolla extus hirsuto-puberula intus glabra late infundibularis ad $\frac{1}{2}$ fissa basi lata, lobis parabolicis acutis erectis. Stamina ut in typo: squamæ cordatæ superne angustatæ ciliis brevissimis crassis nonnullis longioribus præditæ; filamenta late linearia, squamis $\frac{2}{3}$ breviora; antheræ longissimæ lineares obtusæ. Stilus crassus, ut in typo exsertus, ad $\frac{4}{5}$ longitudinis pilosus; stigmata 4–5 stilo 4-plo breviora crassa fusiformia obtusa. Capsula et semina mihi non visa. Flor. Maio.

Syn. C. laciniata Boiss. Fl. Or. Suppl. 330, non Fl. Or.

Hab. Ad rupes m. Lastos insulæ Karpathos (Pichler Exs. Karpath. 439).

Characterized by its small size, wholly whitish indumentum (which in *C. laciniata* consists of very short hooked hairs), regularly and profoundly laciniate leaves, and flowers with short peduncles.

2. **C. Sporadum** (ex affinitate *C. lyratæ* Lamk.). Spectabilis, 2–3-pedalis rarius minor hirsuta vel hirsuto-hispida cinerascens. Caules plures e basi decumbente arcuato-ascendentes vel elati, foliosi, plus minus longe et laxe ramosi. Folia obscura; radicalia semper magna lyrata. Flores magni (rarissime parvi). Receptaculum hirsuto-villosum. Calix demum vix ampliatus; lobi acuti semper erecti; appendices sub irregulariter ventricosæ, receptaculo non adpressæ, cano-hirsutæ. Corolla eâ *C. lyratæ* semper maior latius tubulosa aut angusta et tunc corollam *C. Celsii* simulans. Staminum squamæ latiusculæ ovatæ. Cætera typica. Flor. Aprili, Maio.

Syn. *C. rupestris* A. DC. Prodr. vii., 458 pp., quoad pl. Rhodiam Aucheri—non Sibth.

C. tomentosa Boiss., Fl. Or. iii., 897 pp.

Exsicc. Aucher, Herb. d'Orient, 1301, 3821, 3822.—Bourgeau, Rhodos, 108, 215 ("Celsii"), 109 pp., 216 ("lyrata"). Forsyth-Major 37, 459, 459*a* ("lyrata") 330, 575 ("tomentosa").

Hab. In Sporadum insulis. Rhodi (Aucher) in rupibus maritimis montium Smith & Filierimo (Bourgeau), Kalymni ad Halki, Sami (Forsyth-Major).

This seems to be the local representative of *C. lyrata*, which does not occur in its typical form on the islands mentioned. It is somewhat variable in habit. On dry places it has more the *lyrata*-type, on shady ones it has, when getting flaccid, a certain similitude with *C. rupestris* Sibth., and, especially as to flowers, with *C. Celsii* A.DC.

3. **C. lyratella** (ex affinitate *C. lyratæ* Lamk.). Cinerascenti-virens dense hirsuto-hispidula. Caules stricti, pro altitudine crassi (3–4 mm.) foliosi non rubescentes. Folia hirsutissima undulato-crenata; caulina suberecta. Flores parvi numerosi, in racemum angustum densiorem vix caulis ½ attingentem dispositi. Receptaculum dense hirsuto-hispidum. Calicis lobi ovato-triangulares erecti, corollâ ⅔ breviores, appendices magnæ, receptaculum subbrevius occultantes. Corolla 10–12 mm. longa anguste tubulosa, extus rigide hirsuta. Staminum squamæ subangulato-ovatæ, tenuius quam in typo ciliatæ. Stilus subexsertus cylindricus vix fusiformis; stigmata stilo 4-plo breviora anguste linearia. Flor. Maio, Iunio.

Hab. In Isauriæ aridis montanis inter Koniah et Beychehr (Heldr. Exsicc. 854 in Hb. Boiss. s. nom. *C. lyratæ* var. *micranthæ* Boiss.).

The typical *C. lyrata* is an inhabitant of the coast ranges, where it extends from Adalia in the south, up to Constantinople, and reappears (ex Trautvetter) at the confines of Transcaucasia. *C. lyratella* is an inland plant, found as yet in Isauria only. Its rough dense indument of a dull grey, strong stems, and small and numerous flowers are characteristic.

C. GARGANICA Auct.—The following five species form a small group of pretty Bell-flowers, together with *C. garganica* Ten., under which name they have till now been generally confounded. Their geographic distribution is not without interest. *C. garganica* and *C. Barbeyi* are from Mount Gargano, which is quite isolated from the other Italian mountains, and might well have been connected, in earlier periods, with the opposite Illyrian coast, to which three of the other species belong, one growing further down in Cephalonia. In fact, the connection seems to be traced now-a-days, by the islands that are spread over this part of the Adriatic. *C. garganica* was first described by Tilli in his Cat. hort. Pis. (1723), then by Tenore in 'Memorie della Reale Academia delle Scienze' (1827), where he gives a long description and a very good figure. He afterwards found *C. Barbeyi*, and taking it for a glabrous variety of the former, distributed it under the same name. His description may be applied in a higher or lesser degree to any species of the group, and this explains why Visiani (1842) and Reichenbach, jun. (1860), ascribe to *C. Garganica* their Illyrian specimens, which bear, moreover, a great resemblance to the type.

The group is nearly related to *C. Elatines* L., and *C. elatinoides* Moretti, and also with *C. Portenschlagiana* R. & S. *C. fenestrellata*, especially, has a striking similitude to the latter, as far as leaves and stems are concerned.

In order to limit descriptions of the single species to differential characters, I here give the common characters of the group.

Rhizoma (4–8 cm. long., 4–6 mm. crass.), subeburneum ob foliorum vetustorum bases persistentes dense noduloso-squamosum. Caules diffusi, e saxorum rimis pendentes vel ascendentes, foliosi ramosi. Folia cordato-orbicularia vel cordato-ovata, grosse crenato-dentata petiolata subsimilia ; radicalia petiolis limbo 3–6-plo longioribus prædita. Flores inter minores stricti racemosi. Receptaculum rotundato-cyathiforme, nervis carinalibus conspicuis, suturalibus brevibus. Calicis lobi lanceolati. Corolla cærulea tubo albicante, in speciebus vestitis extus puberula, intus glabra aut imo pilosula, ad ⅔ et ultra fissa, lobis patenti-reflexis. Staminum squamæ dense fimbriatæ ciliis obtusis ; filamenta squamis plus minus longiora angusta ; antheræ lineares apiculo subulato. Gynœceum 3-merum. Stilus exsertus cærulescens, pars inferior glabra superiore incrassatâ pilosâ duplo fere longior. Stigmata linearia. Placentæ crassæ, ad dimidium usque bilobæ. Ovula pauca ovalia. Capsula globosa, nervis prominentibus, parietibus pellucidis, rimâ transversali supra basin dehiscens. Semina parva crassiuscula, ambitu subovalia, basi truncata, uno latere marginata.

C. GARGANICA Ten. (*sensu stricto*). Dense hirsuta vel incano-pubescens, raro glabella flaccida. Caules (20–45 cm. long. 1–1½ mm. crassi) ab imo fere ramosi. Folia dentibus obsoletis aut conspicuis latis obtusis prædita ; radicalia subrotunda ; caulina cordata plus minus acuta. Flores maiusculi, pedunculis tenuibus 3–5-plo longioribus patulis suffulti, racemum longum laxum anguste pyramidalem formantes. Alabastrum angustum cylindrico-conicum. Receptaculum ellipsoideo-cyathiforme. Calicis lobi anguste lanceolati acuti, corollâ ½ breviores, sub anthesi et postea patulo-reflexi. Corolla (10 mm. alta, 15 mm. lata) intus glabra ad ¾ fissa, lobis pulchre cyaneis arcuato-patulis. Staminum squamæ cordato-acuminatæ, filamentis æquilongæ ciliarum longitudine 8-plo latiores ; antheræ filamentorum squamarumque summam longitudine æquantes. Pollen sulfureum. Stilus corollâ duplo longior ; stigmata stilo 8-plo breviora. Capsula parva (3 : 4 mm.). Semina (0·5 : 0·45 mm.) planiuscula lurida opaca rugosula. Flor. Iunio. (v. v.).

Syn. Tilli, Cat. hort. Pis., 1723, p. 29.—Tenore, Memor. lette 1827 alla Reale Acad. Scienze, p. 101, t. 5, f. A. Fl. Neap. iii. 203 ; Icon. t. 224 f. A. Sylloge Fl. Nap. 95.—Sweet, Brit. Fl. Gard. ser. ii. t. 252 (glabriuscula).—Tanfani, in Parl. Fl. It. viii, 115 (excl. loc. Illyr.).

Hab. In Gargani montibus San Angelo et Sacro 300–800 m. alt. (Ten., Gussone, Giordano, Porta & Rigo).

Has leaves of a light or greyish green, and sky-blue flowers on thin and long peduncles.

4. **C. Barbeyi.** Glabra (raro subpuberula) saturate virens rigidula crassiuscula. Caules (15–35 cm. longi, 2 mm. crassi) ab imo fere ramosi. Folia dentibus latis acutiusculis; radicalia subrotunda vel cordata; caulina cordato-ovata plus minus acuta. Flores maiusculi, pedunculis validis æquilongis vel ad 3-plum in longioribus patulis suffulti, racemum laxum angustum compositum formantes. Receptaculum cyathiforme basi truncatum, nervis vix conspicuis. Calicis lobi lanceolati acuti, corollâ ⅓ breviores, sub anthesi et postea patulo-reflexi. Corolla (10 mm. alta, 12–14 mm. lata) paullo ultra ½ fissa undique glabra; lobi violaceo-cærulei raro pallidi arcuato-patuli. Staminum squamæ latæ cordato-acuminatæ, filamentis æquilongæ, ciliarum brevissimarum longitudine 12–15-plo latiores; antheræ summâ filamentorum squamarumque ⅓ longiores. Pollen sulfureum. Stilus corollâ vix 2-plo longior; stigmata stilo 8-plo breviora. Capsula ut in priore. Semina (0·5 : 0·4 mm.) crassiuscula badia nitida. Flor. Iunio. (v.v.).

Syn. *C. garganica* in Lindl. Bot. Reg., t. 1768 (bona).—Taufani l.c. (quoad spec. glabra).

Exsicc. Porta & Rigo, It. Ital., sec., 223 (Hb. Boiss., Reut).

Hab. Iisdem locis cum *C. garganicâ* (Tenore, Schouw, Porta & Rigo).

Constant in culture, and well distinguished by the totality of its characters, this can by no means be regarded as a glabrous form of *C. garganica*, from which it is easily discerned by its solid frame, its thickish leaves of a dark green, and its violet-blue, rarely pale, flowers on rather short peduncles.

I dedicate it to M. William Barbey, of Valeyres, in whose gardens this lovely species is cultivated.

5. **C. istriaca.** Tomentoso-hirsuta, tomento superne densiore, in sicco sæpe flavescente. Caules (20–30 cm. longi, 2–3 mm. crassi), in sicco straminei striati, a medio fere foliati et ramosi, ramis suberectis. Folia duplicato- (raro simpliciter) dentata, dentibus acutis, cordato-vel ovato-acuta. Flores affinium maximi, pedunculis 2–4-plo longioribus, in racemum versus apicem caulis congestum pyramidalem dispositi. Alabastrum magnum (10–12 mm.) late fusiforme. Receptaculum semi-ellipsoideum, nervis etiam suturalibus conspicuis. Calicis lobi corollâ 3-plo breviores, lanceolati obtusiusculi, sub anthesi erecti, demum patuli vel reflexi. Corolla (10–12 mm. alta, ad 20 mm. lata), ultra ¾ incisa, lobis patentibus reflexis, intus basi pilosula. Stamina iis specierum affinium subduplo longiora (10 mm.); squamæ deltoideo-ovatæ longe angustatæ, filamentis subæquilongæ, ciliarum longitudine 3-plo fere latiores; antheræ angustæ, summam filamentorum squamarumque longitudine æquantes. Stilus (16 mm.) longe exsertus, superne paullo incrassatus; stigmata stilo 4-plo breviora, anguste linearia. Capsula (4 : 4·5 mm.). Semina (0·8 : 0·45 mm.) planiuscula flavescentia opaca. Flor. Iunio.

Syn. *C. garganica*, Visiani Fl. Dalm. i., t. 14 (bona) ii., 132 pp.—Rchb. f. Ic. Fl. Germ., t. 247 (indumento neglecto).—Koch, Syn. Germ. Helv. ed. 3. (1857) 407.

C. Portenschlagiana, β. pubescens A. DC. Prodr. vii. 476 pp. ex Herb. Prodr.!

Hab. In Istriâ, ad rupes maritimas: Fianona (Tommasini), in insulis Cherso (Biasoletto) et Veglia (Tommasini ex Koch).

Characterised by its (at least *in sicco*) straw-coloured stems, whitish leaves and large flowers on villous peduncles; it is the most robust species of the group.

6. **C. fenestrellata.** Dense cæspitosa, laete virens, glaberrima. Caules (15–20 cm. longi, 1–2 mm. crassi) decumbentes vel ascendentes, inferne minus foliati, a ½ ramosi ramis erectis. Folia plerumque duplicato-dentata, dentibus magnis triangularibus argutis, ovato-cordata acuta. Flores mediocres, longe pedunculati, racemum versus caulis apicem confertum formantes. Alabastrum (6–8 mm.) ovale. Receptaculum semi-ellipsoideum, nervi carinales virides, cum parenchymate albicante alternante fenestrellas pulchras formantes (inde nomen). Calicis lobi corollâ 3–4-plo breviores e basi angustiore lanceolati, acutiusculi, sub anthesi erecti, demum plus minus reflexi, dentibus plerumque conspicuis. Corolla mediocris (6 mm. alta, 12–15 lata) ad ¾ incisa, rotata micans, intus basi pilosula; lobi lilacini plane patentes, apice recurvi. Staminum squamæ cordato-ovatæ, filamentis sublongiores, ciliarum longitudine 5-plo latiores; antheræ summâ squamarum filamentorumque paullo longiores. Pollen dilute cæruleum. Stilus corollâ 2–3-plo longior; stigmata stilo 6-plo breviora. Capsula (2·5 : 3 mm.) Semina (0·9 : 0·5 mm.) ambitu angulosa brunnea opaca. Flor. Iunio et Iulio (v. v.).

Syn. *C. garganica* Visiani, Fl. Dalm. ii. 132 pp.

Exsicc. Pichler, Pl. Croat. littor. Istr. a. 1869, 1870, 1871.

Hab. Croatia, in monte Vellebit (Pichl.). Dalmatia, loco non amplius indicato (Visiani, Hb. DC.).—Variat caulibus ad 30 cm. longis longius et anguste racemosis, foliis radicalibus maioribus, floribus maioribus et minoribus.

This species is the one most commonly cultivated in the Geneva gardens; it forms large green tufts adorned with flowers of a pale shiny lilac.

7. **C. lepida.** Glabra delicatula. Caules (15–20 cm. longi, 1, 5–2, 5 mm. crassi) ascendentes, in sicco straminei, a medio fere foliati et ramosi, ramis erectis tenuibus ramulosis. Folia iis præcedentis subsimilia, obtusius dentata. Flores parvi, pedunculis 2-plo longioribus tenuissimis strictis plerumque corymboso-fasciculatis suffulti, racemum angustum interruptum formantes. Receptaculum 1 mm. magnum obconicum, interdum setulosum. Calicis lobi corollâ 3-plo fere breviores angusti, sub anthesi erecti, postea reflexi. Corolla (6 mm. alta, 10 lata) ad ⅔ fissa, lobi arcuato-patuli. Staminum squamæ minimæ deltoideæ, filamentis plus duplo breviores, ciliarum longitudine 5-plo latiores; antheræ solis filamentis subæquilongæ, breviter apiculatæ. Stilus corollâ 1½-plo longior; stigmata stilo 5-plo breviora, latiuscula obtusa. Capsula parva (2 : 2·5 mm.). Semina (0·5 : 0·45 mm.) crassa rotundato-ovalia castanea nitida. Flor. Maio.

Exsicc. Rchb. Germ. 321.

Hab. Dalmatia, loco amplius non indic. (Visiani in Hb. DC. & Boiss.), in insulâ Osego (Spruner, Hb. Boiss.)—Origo speciminum Reichenbachio distributorum a cl. incerta ("Dalmatien, an alten Mauern längs des Morlakken-Canals, auf dem Minaret von Dernis, an Felsen um Almissa.").

Though nearly related to the former, and similar as to general habit, it may be distinguished by its small numerous flowers, on thin and, as a rule, clustered peduncles; the stamens and seeds offer good technical characters.

8. **C. Cephallenica.** Inconspicua. Caules flagellares (30–45 cm. longi, 2–4 mm. crassi) ascendentes brunnei, pilis mollibus patulis vestiti, simplices, remote foliati. Folia cordato-ovata grosse et obtuse dentata, indumento adpresso subtomentosa vel glabrescentia. Flores pauci (5–8) minusculi, pedunculis tenuissimis arcuato-patulis subæquilongi in racemum terminalem laxum simplicem dispositi. Receptaculum subglobosum, sicut calices molliter setulosum. Calicis lobi angusti basi attenuati acutissimi, corollâ $\frac{1}{3}$ breviores, sub anthesi et postea reflexi. Corolla (6–8 mm. alta, 10–12 lata) ultra $\frac{3}{4}$ fissa, lobis patulis cæruleis. Staminum squamæ ovatæ, filamentis duplo fere longiores, longitudine ciliarum 6-plo latiores: antheræ summâ filamentorum squamarumque duplo longiores, breviter apiculatæ. Stilus gracilis, corollâ duplo longior, pars eius glabra piliferam subæquans; stigmata stilo 8-plo breviora. Capsula parva (2 : 2·5 mm.). Semina inter maiora (0·9 : 0·5 mm.) subovalia crassiuscula badia nitida. Flor. Iunio, Iulio.

Syn. *C. garganica* Boiss. Fl. Or. iii. 918.

Hab. In insulâ Cephalleniâ pr. Taphiús eparchiæ occid. Paliki (Heldr. exsicc. 3705) et in monte Ainos hodie Montenero (Letourneux, Pl. Or. variæ 3460).

According to its station, which is at a considerable distance from those of the other species, this is distinct in every respect; its long flaccid stems, with sparse leaves and few-flowered terminal raceme, give it a characteristic appearance.

9. **C. Brotherorum** (ex affinitate *C. sarmaticæ* Ker). Hirsuto-hispidula. Caulis erectus subflexuosus (50 cm. altus), pro altitudine gracilis, simplex. Folia iis *C. sarmaticæ* rigidiora, cæterum subsimilia. Flores magni erecti vel subnutantes haud secundi, pedunculis gracilibus longioribus, a medio caule racemum anguste pyramidalem simplicem formantes. Alabastrum (30 mm. fere longum) angustum subclavatum. Receptaculum semi-ellipsoideum. Calix ut in typo. Corolla (30 mm. longa) anguste infundibularis ad $\frac{2}{5}$ incisa, lobis parabolicis erectis in margine ciliatis, cæterum glabra. Stamina iis *C. sarmaticæ* maiora. Stilus inclusus, parte superiore piliferâ incrassatus. Capsula et semina mihi non visa. Fl. Iulio.

Hab. In ditione Ossetiâ Caucasi centralis inter Jedisi et Kadlasem ad flumen Didi Liachva (Broth. Cauc. 592).

A species of secondary order, the habit and characters of which seem, however, to entitle it to an independent place.

10. **C. cantabrica.** Pusilla, obscure virens, surculosa. Radix pro plantâ crassa (8–12 mm. longa) napuliformis, cauliculos plures tenues primo humifusos demum ascendentes emittens. Caules

filiformes erecti subflexuosi (6–10 cm. alti) glabri striati uniflori. Folia parva (6–10 mm. longa); radicalia suborbicularia vel late ovalia margine ciliata; caulina ovata vel plus minus anguste lanceolata obtusiuscula glabrescentia suberecta, margine integro revoluto lineata, ad caulis basin conferta. Flores erecti. Receptaculum anguste obconicum, siccando nigricans, nervis paullo prominentibus æquidistantibus. Calicis lobi (ut in *C. patulâ*) triangulari-lineares acuti erecti subfalcati, corollâ ½ breviores. Corolla anguste infundibularis, undique glabra, vix ad ¼ incisa; lobi late triangulares patuli. Staminum squamæ suborbiculares, breviter ciliatæ; filamenta squamis ½ longiora e basi latiore angustata; antheræ lineares, filamentis solis 3-plo longiores. Pollen luteum. Stili pars inferior glabra stricturâ transiens in piliferam incrassatam obtusam subæquilongam; stigmata late linearia, stilo 10-plo breviora. Ovarium vertice fere planum. Ovula parva numerosa. Capsula et semina mihi non visa (dehiscentiæ locus dubius). Fl. Iulio.

Syn. *C. pusilla* Haenke, var. ? *calycina* Wk. & Lge., Prodr. Fl. Hisp. ii., 292.

Hab. In Hispaniæ bor. montibus Cantabricis, apud Convento de Arvas regni Legionensis in glareosis torrentum (Bourgeau, Pl. d'Esp. 1864, n. 2656 (s. nom. *C. pusilla*, var. ? Cosson).

The concordance of habit which this plant shows with *C. cochleariifolia* Lamk., 1783 = (*C. pusilla* Hænke, 1788), is chiefly a consequence of the fact that both are *species glareosæ.* Most of its characters do not occur in any of the forms of *cochleariifolia;* thus the fusiform root, the dark rigid leaves with revolute borders, the single erect flowers with a long receptacle and broad calyx-lobes, as well as the conformation of the style, separate *C. cantabrica* from the said species, and there remains still an uncertainty as to its nearest relations.

RUBUS SILVATICUS W. & N.

By T. R. Archer Briggs, F.L.S.

So long ago as 1880, when I published the 'Flora of Plymouth,' I thought it possible that a bramble mentioned therein, in the last paragraph under *R. villicaulis*, would prove to be the *R. silvaticus* W. & N. I had not at that time a copy of the 'Rubi Germanici' to refer to, but was led to take this view through noticing the close resemblance between specimens of the plant in question and Continental ones of *silvaticus* received from Dr. Focke.

Since then, however, I have found the English plant to agree fairly well in essential features with both the plate and description of *silvaticus* in the great German work (Rubi Ger. tab. xv. p. 41). Moreover, I had the pleasure last year of showing a growing bush of it to Dr. Focke, and this led to his notice of the species in his recent "Notes on English Rubi" (Journ. Bot. xxviii. p. 130, May, 1890). It is with great satisfaction that I find him saying in reference to the English plants, "Mr. Briggs showed me, near Plymouth, a bramble he supposed to be *R. silvaticus* W. & N., and I think it agrees very well with that species."

As this *Rubus* is very well marked, and one which I have good reason to think will be found to have a wide distribution in England, I consider it well to call the attention of English botanists to it by a special notice and description, the latter drawn up from fresh specimens :—

R. SILVATICUS W. & N.—*Stem* arcuate-prostrate, strong, often branched, angular, with polished flat surface or shallow furrows, green or purplish green, glabrous, or occasionally with some hairs. *Prickles* fairly numerous, short, very strong, mostly uniform in size, from a long, greatly-compressed base, declining, confined to the angles. *Leaves* all 5-nate, stalked. *Leaflets* dentate-serrate towards their tip, coarsely and simply serrate below, green on both sides, with scattered hairs above, thickly pilose beneath, equidistant, remarkably waved at and towards the edges ; basal narrowly obovate or oblong, acute, with sides more or less unequal and narrowed at the base ; intermediate obovate, abruptly acuminate, narrowed or wedge-shaped towards the base ; terminal long-stalked, obovate- or oval-acuminate, sometimes subcordate at the base ; petioles with many short, strong, uncinate or declining prickles ; stipules linear-lanceolate.

Flowering shoot rather long, with short hairs. *Prickles* few, or fairly numerous, short, declining, from very long, compressed bases. *Leaves* 5-nate, much resembling those of the stem. *Panicle* often compound, narrow from beyond its lowest portion, somewhat flexuose, thickly clothed with short, uniform, woolly hairs, especially towards the top; prickles very few, short, declining, lower branches axillary, sub-patent, from at least 3-nate leaves, racemose-corymbose ; branches short, patent or sub-patent, from 3-nate, lobed or simple leaves, which are remarkably acuminate and coarsely cut, gradually degenerating into long trifid or simple bracts that are present to the top of the panicle ; smaller branches often three-flowered, with each peduncle at nearly a right angle to the branch from which it springs ; peduncles sometimes with a number of slender aciculi. Sepals thickly clothed with short woolly hairs and felted, ovate, with short point, reflexed from the fruit.

Petals ovate, large, uniform, concave, emarginate, suddenly narrowed into a short claw, pure white ; stamens long, exceeding the styles ; filaments white. *Styles* yellowish green. *Fruit* uniform.

The marked features of this bramble place it among our most distinct and easily recognised ones, and, as a Plymouth plant, I have known and observed it for more than twenty years past. It occurs very generally in open bushy spots and hedges, not attaining full development in shade or thickly wooded places.

I possess a specimen collected so long ago as 1843, by the Rev. W. H. Coleman, whose name appears on the label, together with the particulars, "Rubus, Thieves Lane, Hertford, 1843–7–14.—No. 1012." To this some one has added in pencil-markings, "*nitidus ;*" by this name having doubtless meant the *nitidus* of Bell-Salter, our present *Lindleianus* Lees, to which species *silvaticus* bears considerable resemblance, although by its mode of growth it belongs to another of Babington's groups.

Apart from the neighbourhood of Plymouth I have seen or received this *Rubus* from the following places in England:—

E. Cornwall: Between Doublebois and Liskeard; S. Neots; near Lavethan, Blisland.

S. Devon: Avon Valley, between S. Brent and Dartmoor; Roster Bridge, near Totnes; Bovey Tracey; Canonteign Down; Lustleigh.

N. Devon: Lynton; *Herb. Rev. W. Moyle Rogers.*

S. Wilts: Landport; *E. J. Tatum; Herb. id.*

Dorset: Gore Heath, near Wareham; noticed here in company with Dr. Focke and the Rev. W. Moyle Rogers in 1889.

Surrey: Sheen Common; *Herb. W. P. Hiern.*

Herts: Thieves Lane, Hertford; *Rev. W. H. Coleman.*

Salop: Hedge, Longwynd Hill, in plenty, 1886; *Herb. Rev. W. Moyle Rogers.*

OLD HERBARIA.

We take the following from an interesting paper by Mr. G. C. Druce, published in the 'Pharmaceutical Journal' for January last:—

"The origin of the word *herbarium*, as applied to a dried collection, is by no means certain. It is true we frequently meet with the name in the older writers, but to them it meant a book about plants, and generally an illustrated book. Tournefort alluded to the 'Herbarium' of Fuchs, when he referred to his 'Historia Stirpium'; so too the 'Herbarium' of Mattioli did not refer to his collection, but to his 'Commentary on Dioscorides.' But it is evident that dried plants were sent by one botanist to another, for Mattioli alludes in 1543 to plants that had been sent to him; but whether these were dried in bundles or fastened to paper is left uncertain. It is probable that one of the earliest herbaria formed was made by Luca Ghini, Professor of Botany at Bologna, about 1540. From a letter of Maranta to Mattioli it is evident that Ghini sent several plants that were glued on paper and labelled to Mattioli, very shortly after the publication of Mattioli's 'Commentary' in 1548. Ghini died in 1556. Two pupils of his, Cesalpini and Aldrovandi, made herbaria; and our own countryman, Falconer, who certainly had a Hortus Siccus between 1540 and 1547, was probably also taught either at Bologna or Pisa by Ghini. In Wm. Turner's 'Herbal,' when referring to *Glaux*, he says he 'never saw it in England except in Master Falconer's book, and he brought it from Italy.' Amatus Lusitanus, who was at Ferrara from 1540 to 1547, speaks of this book of Falconer's as a singular curiosity, such as he had never seen before. No traces of this book, so far as we know, exist.

"Aldrovandi, the pupil of Ghini, who died in 1605, left to the University of Bologna a large quantity of curiosities, among which was an 'Index Plantarum omnium quas in sexdecim voluminibus diversis temporibus *ex siccatus agglutinavit*.' Cesalpini distinctly alludes to two dried collections of plants which must have been formed by him before 1574. The oldest existing collection of which I am aware is that of Jean Girault, of Lyons, 1558. Rauwolf brought home from the East over 500 dried plants collected in the years 1573 to 1576. Rauwolf says of two plants found near Tripoli that he had glued them with various other foreign plants. They were preserved in the library at Leyden. Aldrovandi's collection existed in the early part of the seventeenth century. Whether it is still preserved I am at present unable to say. It was made, as was that of Cesalpini, between 1553 and 1563. Adrian Spiegel was probably the first author who described the method of drying plants, which he did in his 'Isagoges in rem herbariam,' 1606. He gives the name *hortos hyemales* to the volumes of dried plants.

"It has recently been my good fortune to meet with, at Oxford, among some bundles of specimens, a very old collection of dried plants. They had probably been at Oxford for some years, for the bundle was labelled on the outside by the old curator, Mr. Baxter, 'A collection of very old plants, chiefly British, with MS. descriptions and synonyms. Looked over and cleaned, September, 1862.' Under this Professor Daubeny had written, 'In the handwriting of Dillenius, with long description of each plant attached.'

"When the parcel was handed to me by the curator, I saw at once that it was not Dillenius's handwriting, with which I was very familiar. On taking it home I quickly saw that the plants were not British. After a little study I came upon a label which gave me a clue to their home, and subsequent research proved them to have been collected by a Capuchin, Gregory of Reggio, in the province of Bologna (not the more celebrated Reggio in Calabria), in 1606. Many of these specimens are admirably preserved. They were fastened on the paper by means of little strips of paper, not glued, but with some resinous cement, of which olibanum was the principal ingredient. To each plant was attached a paper label, just as the majority of botanists fix them now, *i. e.*, by cutting a line through the top, and through this loop pushing the plant.

"The labels in themselves are most interesting, as Gregory gives the synonyms used for the plants by the early writers, Mattioli, Lobelius, Cesalpini, Fuchs, Camerarius, Tragus, &c. Also the habitats of the plant in a few cases precisely localised, its therapeutic uses, and the date of flowering. Occasionally he gives reasons for differing from preceding authors, or again gives a name to what he considers to be a new species. Altogether, I suppose this collection to be unique. It was bound in the leaves of an Italian service book, and labelled at the back, 'Herbarum Divers-[arum] Nat[uralium] Gregorii a Reggio.' This name probably has precedence over any other as the title of a collection of plants.

"A writer in the 'Gardeners' Chronicle' says that he knew of the existence of the Hortus Siccus of Gregory of Reggio, but he refers him to the Calabrian not the Bononian Reggio. It is to the latter he really belongs. He was noted for his botanical knowledge, 'herbarum diligentissimus et indefessus investigator, qui plurimus novas reperit plantas variisque misit, doctissimis in re herbarus viris, a quibus honorificentissime memoratur.' See Anton. Bumaldus in 'Bib. Bonon.,' p. 97.'"

It may be of interest to add some notice of a herbarium which has lately been transferred from the Kew collection to the Botanical Department of the British Museum. It was formed by J. M. Ferro, a Venetian apothecary who died in 1673, and is in an excellent state of preservation. It was at one time in the possession of L. C. Treviranus, who refers to it in his 'Die Anwending des Holzschnittes zur bildlichen Darstellung von Pflanzen' (1855), p. 46.* It is in three volumes, each with a written title-page, of which the following is a transcription, in an ornamental printed border of German design:—

"Ioannis Mariæ Ferro Veneti Aromatarū
Theatrū Vegetabiliū
Summo
Labore, Industria, Sudore, Vigilantia & Experientia
ab eodem
collectorū & in tres Libros digestorū ac dispositorū
Qui
quamplurima alia usq. ad perfectionem
sibi
propositi Operis adiunxisset aliosq. libros confecisset,
Typis
ad hominū utilitatem Opus prestantissimū mandaturus
Ni
Morbo Lethali calculi in Vesica conflictatus, & preūentus
Vita
Cum Morte commutasset
A. D.
M.D.C.L.XXIII
Die
XIX Mensis Junij
Aetatis LXX"

The index to each volume is in the same handwriting as the above; on the back of the title of the first is the following, in another hand:—

"In Joannem Mariam Ferro Aromatarium Venetum
expertissimum
Primum in arte Botanica
ex innato Calculo Mortuum
etatis
LXX.

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* "Das von diesem Ferro nachgelassene Herbarium, welches ich besitze, besteht aus drei starken Bänden, deen jeder einen geschriebenen Titel hat, eingefasst in einen herrlichen Holzschnitt von der Arbeit eines nicht bezeichneten, aber augenscheinlich deutschen Künstlers."

Venetiis Ferro, experto medicamine noto
  Calculus innatus, vitaque morsque lapis:
Vita fuit languens, mors dura, exsectus, in orbe
  Æternum Ferro, Nominis omen erit."

The plants are all carefully named, no doubt by Ferro himself, but none have localities added; they are, as has been said, in an excellent state of preservation.

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.

By James Britten, F.L.S., and G. S. Boulger, F.L.S.

(Continued from p. 248.)

Salter, Anthony (fl. 1696). Physician. Of Exeter. Park. Theatr. 1219. Correspondent of Johnson. Pult. i. 154 (**Sadler** by mistake).

Salter, John William (d. 1869): d. Gravesend, 17 July, 1869. A.L.S., 1842. Botanical draughtsman. Drew plates for Suppl. to Eng. Bot., vols. iv. (1849), v. (1863), and wrote preface to vol. v. Journ. Bot. 1869, 280; R. S. C. v. 382.

Salter, Thomas Bell (1814–1858): d. Southampton, 30 Sept., 1858. M.D., Edin. F.L.S., 1837. F.B.S. Ed. 'Botany of Poole, 1839. Contributed to Phyt. i.–iv. Practised at Ryde. Studied *Rubi.* Edited (with Sir W. J. Hooker) Bromfield's 'Flora Vectensis,' 1856. Herbarium presented to Linnean Soc. Pritz. 277; Jacks. 602; Proc. Linn. Soc. 1859, xxxiv.; R. S. C. v. 385.

Salwey, Rev .Thomas (d. 1878): d. Worthing, Sussex, 1878. B.D. Camb., 1826. F.L.S., 1824. Rector of Oswestry, Salop. Lichenologist. Contrib. to Ann. and Mag., Trans. Bot. Soc. Ed., and E.B. 2667, 2796, 2861, 2963. 'Lichenes Britannici exsiccatæ.' Bot. in D. Jones's Guide to Harlech, 1863. Found *Allium triquetrum* in Guernsey, 1847. R. S. C. v. 387; Journ. Bot. 1878, 63. *Lecidea Salweii* Borrer.

San Giorgio, Contessa Anna di (*née* **Harley**) (d. 1874). 'Catalogo poliglotto delle piante': Florence, 1870, Jacks. 9.

Sansom, Thomas (d. 1862). A.L.S., 1843. F.B.S. Ed. Of Liverpool. Papers on Mosses, and in Proc. Lit. Phil. Soc. L'pool, 1849–55. 'Fungoid disease of Pear.' Trans. Hist. Soc. Lanc. viii. 1856; R. S. C. v. 397.

Saunders, Samuel (fl. 1780–1792). Of Leatherhead. Friend of Sir J. E. Smith. 'Introduction to Botany,' 1792. Pritz. 278; Jacks. 34.

Saunders, William Wilson (1809–1879): b. 1809; d. Worthing, Sussex, 13 Sept., 1879. F.L.S., 1833. F.R.S. 'Refugium Botanicum,' 1868–73. 'Mycological Illustrations,' 1871–2. Herbarium at the Oxford Museum. Portr. Kew. Pritz. 278;

Jacks. 602; R. S. C. v. 412; Journ. Bot. 1879, 320; Gard. Chron. 1879, ii. 368; Proc. Entomol. Soc. 1879, lxvi.; Proc. Linn. Soc. 1875–80, lviii. Portr. at Kew.

Scheer, Frederick (1792?–1868): b. Rügen, 1792?; d. Northfleet, Kent, 30 Dec., 1868. Cultivated Cacti at Kew Green. 'Kew and its gardens,' 1840. Contributed to 'Bot. of 'Herald.'' 'New *Mamillaria*,' Journ. Bot. 1845, 136; Pritz. 280; R. S. C. v. 447; Gard. Chron. 1869, 964. *Scheeria* Seemann = *Achimenes*.

Scoffern, John (fl. 1839–1870). M.B. 'Outlines of Botany,' 1857. R. S. C. v. 602; Jacks. 43.

Scott, Hercules R. (fl. 1836). Of Edinburgh. Advocate. Sent list of plants to A. Murray ('Northern Flora,' 21).

Scott, John (1838?–1880): b. Denholm, Roxburghsh., 1838?; d. Garwald, East Lothian, 10 June, 1880. F.L.S., 1873. Curator, Calcutta Bot. Gard. 'Tree-ferns of British Sikkim,' Linn. Trans. xxx. Contrib. to Trans. Bot. Soc. Ed., and to Journ. Linn. Soc. viii. & x. Jacks. 389. R. S. C. v. 606; Journ. Bot. 1880, 224; Trans. B. S. Ed. xiv. 160.

Scott, Robert (d. before 1813). M.D. Prof. Bot. Dublin, 1804. Bryologist. Friend of Dawson Turner. Contrib. Mosses to E. B. 1181, 1391, 1564. Rees (sub *Scottia*). Miniature portr. at Kew. *Scottia* Br.

Scouler, John (1804-1871): b. Glasgow, 31 Dec., 1804; d. Glasgow, 13 Nov., 1871; bur. Kilbaschan. M.D., Glasgow. F.L.S., 1829. Zoologist and Geologist. Prof. Mineralogy, Dublin, 1833–54. Pupil of W. J. Hooker. Collected in N. W. America, 1825–7. Plants described in 'Fl. Bor.-Amer.,' 1840. Bot. Misc. i. 34; Trans. Geol. Soc. Glasgow, iv. 194; R. S. C. v. 607. *Scouleria* Hook.

Scott, James Robertson (1789?–1821): b. 1789?; d. 30 Aug., 1821. F.L.S. F.R.S.E. Lecturer on Bot., Edinburgh. Pritz. 293.

Seaforth, Francis Lord (fl. 1809). Governor of Barbados, where he collected Algæ for Dawson Turner. Turn. Fuci, ii 130. 'Botanices periti cultoris et fautoris,' Brown. *Seaforthia* Br. *Fucus Seaforthii* Turn.

Sealy (d. before 1834). Collected in Co. Cork. Herbarium sent to Sir W. Hooker. Eng. Bot. 2782.

Seemann, Berthold Carl (1825–1871): b. Hanover, 28 Feb., 1825; d. Javali Mine, Nicaragua, 10 Oct., 1871. M.A. and Ph.D. Göttingen. F.L.S., 1852. On H.M.S. 'Herald,' 1846–1851. 'Narrative,' 1853. 'Flora Vitiensis,' 1865. In Venezuela, 1864. Edited 'Bonplandia,' 1853–1863, and Journ. Bot. 1863–69. Pritz. 293; Jacks. 605; Journ. Bot. 1872, 1, w. portr.; Proc. Linn. Soc. 1871–2, lxxiv; Gard. Chron. 1871, 1678, w. portr.; Portr. in 'Men of Eminence,' 1866; Allibone. Portr. at Kew. *Seemannia*.

Selby, Prideaux John (1789–1867): d. Twizell, Northumberland, 27 March, 1867. Of Twizell. Ornithologist. F.L.S., 1826. 'British Forest Trees,' 1842. Pritz. 294; Jacks. 245; Allibone. Portr. in Ipswich Museum series. Copy at Kew.

Seller, William (1798–1869): b. Peterhead, 1798; d. Edinburgh ?, 11 April, 1869. M.D., Edin., 1821. F.B.S. Ed., 1843, Pres., 1857. 'Nutrition of Plants,' Edin. New. Phil. Journ. xxxix. 50. 'Plants from Davis' Straits,' Trans. Bot. Soc. Ed. ii. 215. Trans. Bot. Soc. Ed. x. 203.

Seward, John (fl. 1794). M.D. Of Worcester. A.L.S., 1796. Discovered *Hypericum dubium*. E. B. 296.

Seymer, Henry (1745–1800): b. Hanford, Dorset, 1745; d. 3 Dec., 1800. Of Hanford, Dorset. B.C.L. Oxon. 1771. D.C.L. 1777. Friend of Pulteney and Solander. Step-uncle of A. B. Lambert. Had a garden of exotics. Pursh, Fl. Amer. Sept. ii. 737, Nich. Anec. viii. 201. Hutchins' Hist. of Dorset, iv. 66. Oil portr. at Linn. Soc. *Seymeria* Pursh.

Sharpe, Daniel (1806–1856): b. Marylebone, 1806; d. London, 1856. Geologist. Collected in Portugal. F.G.S., 1827. F.L.S., 1828. Fossil and Portuguese pl. in Herb. Mus. Brit. Quart. Journ. Geol. Soc. vol. xiii. 1857, xlv. E. B. 2990. R. S. C. v. 672. Engr. portr. in Bot. Dep. Brit. Mus.

Sharrock, Robert (fl. 1660–1694). Fellow of New Coll., Oxford. 'History of Propagation of Vegetables,' 1660. 'History of Plants,' 1694. Pritz. 296.

Shaw, George (1751–1813): b. Bierton, Bucks, 10 Dec., 1751; d. British Museum, 22 July, 1813. B.A. Oxon. 1769. M.D., 1787. V.P.L.S., 1789. F.R.S., 1789. Deputy Bot. Lecturer to Sibthorp at Oxford, 1786. Assistant Keeper of Nat. Hist. Mus. Brit., 1791. Keeper, 1807. 'Cimelia Physica,' 1796. Wrote descriptions for Freeman's 'Select Specimens of British Plants,' and also some for Eng. Bot. Mag. Nat. Hist. i. 304. Gent. Mag. 1813, ii. 290.

Shaw, Henry (1800–1889): b. Sheffield, 24 July, 1800; d. St. Louis, Missouri, 25 Aug., 1889. Merchant. Founded Missouri Bot. Garden, 1848; established Shaw School of Botany, Washington University: published Engelmann's Botanical Papers, 1887. Gard. Chron. viii. (1890), 46.

Shaw, Rev. Thomas (1693–1751): b. Kendal, Westmoreland, 1693; d. Oxford, 15 Aug., 1751; bur. Bramley, Hants. B.A. Oxon., 1716. D.D., 1734. F.R.S., 1734. Chaplain at Algiers till 1733. Principal of St. Edmund Hall and Vicar of Bramley, 1740. 'Travels in Barbary,' 1738, w. appendix, enumerating pl., by Dillenius. Pl. at Kew, Journ. Bot. 1880, 256. Pult. ii. 173; Pritz. 296; Jacks. 346. Forster, Gen. p. 96; Nich. Anecd. ii. 287; Nich. Illustr. i. 287. Nicholson, 'Annals of Kendal,' 346. *Shawia* Forst. = *Olearia*.

Sheffield, Rev. William (1732 ?–1795): b. Henley, Warwick, 1732 ?; d. Oxford ?, 23 June, 1795. B.A. Oxon., 1754. D.D., 1778. Keeper of Ashmolean Museum, 1772–1795. Early friend of Banks. 'Botanico Oxoniensi imprimis perito,' Forster, Gen. t. ix. Rees. Nich. Illustr. v. 517. *Sheffieldia* Forst. = *Samolus*.

(To be continued.)

SHORT NOTES.

Arabis albida naturalised in Derbyshire.—On the 5th inst. I was much surprised to meet with *Arabis albida* Stev. in great quantity on the northern face of a limestone rock at Matlock Bath. The site is opposite the High Tor. The rock rises from a quarry and stretches upwards to the Heights of Abraham. The plant is plentiful in gardens in and about Matlock; but there is no house or garden near to the cliff on which it has made its home. None of the plants showed blossoms, though most of them had ripened and shed their seeds. The habitat is like a natural one, but of course it is only an accidental case of naturalisation.—W. M. Hind.

Ranunculus ophioglossifolius in East Gloucestershire. — A specimen of this very rare plant was recently sent me by Mrs. Francis Fawkes, who informed me that she found it in a small marshy piece of ground of very restricted area. About a dozen plants were seen. For obvious reasons she does not wish the exact locality disclosed, but hopes before long to send me a further specimen for the British Herbarium in the Natural History Museum at South Kensington.—Frederick J. Hanbury.

Flora of Suffolk. — The Herbarium of Suffolk plants, specially collected for the preparation of Rev. Dr. Hind's recent 'Flora,' has been presented by him to the Ipswich Museum.

Arenaria gothica Fries.—This plant was on the 18th August collected in another West Yorkshire locality by Dr. Silvanus P. Thompson and his sister Miss R. F. Thompson. Dr. Thompson had, in the course of a walk a few days before, noticed what he thought looked like *A. gothica*, and on the 18th he went to the spot again with Miss Thompson, who at once recognised the characters of the Ribblehead plant. The new locality is three miles distant from Ribblehead, and away from any railway. I cannot at present report more. There is now a hope, at any rate, that the plant is indigenous to Yorkshire. Its presence at Ribblehead was certainly inconclusive, particularly as several attempts have been vainly made this year to discover it in the district surrounding the station, and about the quarry whence the road-metal used in the station yard was brought. I regret to add that the *A. gothica* is already in danger of extinction at Ribblehead. When Mr. F. Arnold Lees visited the spot in September, 1889, there were "hundreds" of plants. "Dozens of collectors have been there this year," the Ribblehead peeple say, and the result is that the very existence of the species is threatened. Is it too much to ask that a "close time" of at least two seasons be accorded to it? I appeal to the honour of botanists. *A. gothica* has, in its Yorkshire form, been proved undoubtedly perennial. Plants grown by me (transplanted from Ribblehead) put forth winter shoots like those of garden pinks, or *Saxifraga hypnoides*. Winter and spring specimens sent to me bore the same, and plants flowering in April still showed the empty capsules of the previous year.—William Whitwell.

REPORT OF THE DEPARTMENT OF BOTANY, BRITISH MUSEUM, FOR 1889.

By William Carruthers, F.R.S.

During the year 51,652 specimens have been mounted, named, and inserted in their places in the Herbarium. These have consisted chiefly of plants from Europe, collected by various botanists; from Portugal, by the Rev. R. P. Murray; from Greece, by Haussknecht; from Singapore, by Ridley; from China, by Hance; from Japan, by Bisset; from Borneo, by Whitehead; from the Atlas Mountains, by Johnstone; from Socotra, by Professor Balfour; from Madagascar, by the Rev. Deans-Cowan, and others; from South Africa, by Professor MacOwan, Bolus, and others; from Australia, by Von Mueller, and others; from Canada, by Professor Macoun; from Mexico, by Palmer and Pringle; from Dominica, by Ramage; and from the Republic of Columbia, by Lehmann.

In the progress of incorporating these additions, the following Natural Orders have been more or less completely re-arranged:—*Caryophyllaceæ*, *Hypericineæ*, *Guttiferæ*, *Ternstroemiaceæ*, *Compositæ*, *Cupuliferæ*, *Iridaceæ*, *Commelinaceæ*, *Gramineæ* and *Filices*.

The Fungi have been entirely re-arranged; numerous Algæ have been incorporated with the Herbarium, as well as extensive series of Musci and Lichenes.

The exhibited series of British plants has been completed, as far as the vascular plants are concerned, every species recognised by Bentham, in his British Flora, being placed in the case, with its description from that work.

A thorough revision and improved arrangement of the specimens and illustrations exhibiting the Natural Orders of plants has been begun, and the whole of the Monocotyledonous Orders have already been completed.

The extensive series of original drawings of Indian and Chinese plants have been mounted, named, and systematically arranged.

The principal additions to the Herbarium during the year have been the acquisition by purchase of the microscopic preparations made by the late Professor de Bary, of Strassburg, in connection with his investigations into plant anatomy and the parasitic diseases of plants. The total number of slides in this collection is 4429, and of these 1220 are Fungi illustrating the life-histories of many plant diseases described by de Bary, in numerous scientific papers; 206 slides of Lichens, showing especially the structure of the thallus; 105 Characeæ; 40 Algæ; 11 Musci; 286 Vascular Cryptogams; 1160 Flowering plants; 1112 slides illustrating de Bary's researches on Plant Anatomy as described in his published works, and 289 slides showing various points of plant structure.

The Herbarium of Lichens formed by Horatio Piggot Esq., has been presented by him to the Trustees. It contains many specimens collected by himself, and numerous specimens communicated by Mudd, Leighton, and others, including the collection of Dr. Deakin, consisting altogether of 2383 specimens. It forms a valuable addition to the collection of Lichens.

The additions to the collections by presentation during the year have consisted of 6 Fungi from South West France, from W. W. Strickland, Esq.; 190 Indian plants from C. B. Clarke, Esq., F.R.S.; 9 Algæ from the Tizard Reef, China Sea, from P. A. Bassett-Smith, Esq., R.N.; 172 Singapore plants from H. N. Ridley, Esq.; 415 Indian plants from Dr. King, C.I.E., F.R.S.; 349 Indian plants from J. F. Duthie, Esq.; 16 Marine Algæ and 82 Mosses from Japan, from James Bisset, Esq.; 25 Fungi, 1 Alga, 6 Lichens, and 2 Hepaticæ, and 5 Mosses, from H. N. Ridley, Esq.; 52 slides illustrating the life-histories of *Ravenelia*, *Mycoidea*, &c., from Surgeon-Major Barclay; Alga, from Hot Spring at Singapore, from H. N. Ridley, Esq.; *Trentepohlia spongophila*, *Caulerpa macrodisca*, and *Struvea delicatula*, from Madame Weber van Bosse; 35 Algæ and 5 Mosses from India, from Dr. de Crespigny; 35 Algæ from Madras, from E. Thurston, Esq.; 85 plants from the Atlas Mountains from Joseph Thomson. Esq.; 211 South African plants from Professor MacOwan; *Parmelia Hottentota* Ach., from N. Masterman, Esq.; 12 Mosses, 6 Hepaticæ, 10 Lichens, and 8 Fungi from Madagascar, from Rev. J. Wills; 402 Australian plants from Baron von Mueller; 58 Fresh-water Algæ from New Zealand, collected by Dr. Berggren, from Dr. Nordstedt; 454 Algæ and a fine specimen of *Struvea macrophylla*, from George Clifton, Esq.; *Lepidozia reversa*, a new species from Queensland, from W. H. Pearson, Esq.; 398 Dominica plants collected by Mr. Ramage, from the Royal Society Committee on the exploration of the West Indian Islands; 160 South Californian plants, collected by E. Palmer, Esq., from the Smithsonian Institution; 160 plants from the Buckley Herbarium, from the Shaw School of Botany; 234 British Columbian plants from Professor Macoun; *Grimmia torquata*, in fruit, from Mrs. Britton; *Derbesia vaucheriæformis*, from Professor Farlow; 9 British plants from the Messrs. Groves; 37 British plants from W. H. Beeby, Esq.; 109 British plants from A. Bennett, Esq.; *Potamogeton varians*, from Alfred Fryer, Esq.; *Plantago lanceolata*, var., from J. C. Melvill, Esq.; *Rubus pallidus* from Somerset, from J. W. White, Esq.; a collection of British species of *Carex*, with the parts of the inflorescence and fruit dissected and carefully drawn, from Dr. Priestley; 41 British plants from the Misses Thompson; 2 British plants from Miss Woolward; *Hypericum linariifolium* from Carnarvonshire, from Professor Babington; 16 British plants from G. C. Druce, Esq.; *Linaria spuria*, from A. J. Crosfield, Esq.; monstrous flowers of Ivy, from Dr. M. T. Masters, F.R.S.; a remarkable fasciated *Daphne* from T. Harcourt Powell, Esq.; 13 Dumfriesshire plants from J. J. Johnstone, Esq.; 254 British plants from the Rev. E. S. Marshall; 20 British plants from H. Monington, Esq.; *Polyporus igniarius* from E. Allen, Esq.; *Sphærocarpus Michelii*, from Suffolk, from the Rev. H. P. Reader; *Didymium dædaleum* from W. G. Smith, Esq.; *Puccinia Schroeteri* on Daffodil, from W. G. Smith, Esq.; *Nitella batrachosperma*, from the Outer Hebrides, new to Britain, from A. Bennett, Esq.; Diatomaceæ, from the Thames, from W. H. Shrubsole, Esq.; *Codium Bursa*, from Worthing, from Miss C. Spong; 3 species of

British Sphagnum from Dr. Braithwaite; 46 Commelinaceæ and 1 *Flagellaria* from C. B. Clarke, Esq., F.R.S.; 13 Orchids from Miss Woolward; 41 Orchids from F. W. Moore, Esq.; 40 Orchids from H. Veitch, Esq.; 2 *Nepenthes* from H. Veitch, Esq.; 99 Algæ and 129 Lichens from John Dillwyn Llewelyn, Esq.; 177 preparations of cellular plants; section of stem of *Dracophyllum*, from New Zealand, from J. D. Enys, Esq.; seeds of *Sophora speciosa* from E. M. Holmes, Esq.; and specimens of plants from Kahun, Middle Egypt, from tomb, about 2600 B.C., found by Mr. Flinders Petrie, from H. M. Kennard, Esq.

The following collections have been acquired by purchase:—100 plants from Stanley Falls, Congo, from F. Heus; 339 plants from Natal; a small collection of plants from Kina Balu, collected by J. Whitehead; 100 Freshwater Algæ, of France, from Mougeot, &c.; 150 Freshwater Algæ from Wittrock and Nordstedt; 50 Italian Algæ from De Toni and Levi; 25 parasitic Fungi from Briosi and Cavara; 600 Fungi from Sydow; 390 Portuguese plants from the Rev. R. P. Murray; 40 species of Danish *Rubi*; 2928 plants from Greece, from Haussknecht; 200 specimens of Schultz's Herbarium Normale; 223 Ægean plants from Heldreich; 100 plants from Greece, from Heldreich; 208 Mexican plants, collected by Schumann; 850 American plants, collected by Pringle; 50 American Algæ from Farlow; 25 British Algæ from Holmes; 114 slides of British Algæ from Buffham; 100 specimens of wood-sections by Nordlinger; 63 sections of woods; and 121 preparations of Fossil plants from Sir Joseph Hooker; a collection of Tertiary plants specially prepared by Baron Ettingshausen for comparison with recent plants.

By exchange the following collections have been acquired.—A series of Algæ from the Baltic, collected by Professor Reinke, of Kiel, many of which are type specimens; 72 species of European cellular plants from E. M. Holmes; and specimens of *Prosopanche Burmeisteri*, new species of *Brugmannsia*, *Rafflesia*, and *Cymopolia*, specimens of *Phytocrene*, *Ceratozamia*, and *Peridermium Pini*, from Count Solms Laubach.

NOTICES OF BOOKS.

A Handbook of the Flora of Extra-tropical South Australia. By Ralph Tate, F.L.S. Adelaide: published by the Education Department. 1890. 8vo, pp. vi. 303.

The true test of the value of such a volume as this is, of course, its practical working in the field; and this, for obvious reasons, we are unable to apply. But so far as we can judge, Prof. Tate has succeeded in producing, in small compass and in pocketable form, a little Manual which will be to the South Australian botanist what 'Babington' has been to many generations of those at home; while the type and arrangement of the volume leave nothing to be desired.

"The work is intended for those who have mastered the elements of Botany, and who wish to be acquainted, as rapidly and readily as may be, with the name and systematic position of any of our native plants." The plan of the key to the genera and species, which occupies most of the book, is adapted from the 'Flora Australiensis,' the characters of the latter being in most cases comparative only as regards South Australian species. Following this comes a classified list of the native species, in which much use has been made of Baron von Mueller's 'Census of Australian Plants,' tabulated so as to show the distribution of each species through the twelve districts into which Prof. Tate has subdivided the province. "Two chief floras are recognised:—(1) The Eremian or Desert Flora, which occupies the arid regions of Central Australia, and corresponds with the 'Salt-marsh country' of the pastoralist. The region is approximately limited by the rain-fall line of ten inches. (2) The Euronotian Flora, which is dominant in the more humid parts of Temperate Australia, excepting the extreme south-west." Five of the subdivisions fall under the former head, seven under the latter. The Flora includes 101 orders, 553 genera, and 1935 species.

An explanation of specific names is followed by an index to the orders and genera, with explanations of generic names. There is some ground for criticism here, mainly on account of the want of uniformity in the generic explanations. Thus we have—

"Ammannia; after a botanical professor at St. Petersburg.
"Bignoniaceæ; from Bignonia, a personal name.
"Burtonia; personal name.
"Cæsia; after F. Cæsius (1703).
"Crantzia; after a botanical author (1762–68).
"Claytonia; after a botanical collector.
"Hermannia; after Prof. Hermann, of Leyden, died 1695."

—and other variations might be cited. It would have been easy to adopt a uniform plan, which would take no more space and give fuller information. This, however, is but a small matter. It concerns us much more to draw attention to the excellence of the work, and to express a hope that we may soon have similar handbooks for our various colonies.

Mr. F. M. Bailey, the Queensland Colonial Botanist, sends us a "Third Supplement" to his 'Synopsis of the Queensland Flora' published in 1883, which, containing as it does about a hundred additional species, shows that the Flora of the Colony is receiving careful attention at his hands. The plants in question were mainly collected by the Bellenden-Ker Expedition. Some of the specific names seem unnecessarily ugly, such as *Leptospermum Wooroonaran* ("the aboriginal name for Bellenden-Ker"), *Desris Koolgibberah* ("the aboriginal name for the Mulgrave River"). Figures are given of many of the Ferns, Mosses, and Hepaticæ; we note, however, that of the novelties in the two latter groups, the name only, without description, is given.

We have received two singularly useless little books which form part of "Darlington's Naturalist Series," and are issued by a publisher of that name at Llangollen. The first is entitled 'Wild Flowers of the Vale of Llangollen, Corwen, and Bala'; the second, 'Wild Flowers of Aberystwith and Cardigan Bay'; and there are others of the same kind. No author's name is given, so that we can hurt no one's feelings by characterizing the books as rubbish. They are full of blunders, and give no information of value: moreover, no Grasses or Sedges are included. *Matthiola* "*vincana*" appears in each; the latter contains *Saxifraga Hirculus*, *S. umbrosa*, *Trifolium stellatum*, *T. glomeratum*, *Astragalus hypoglottis*, *Daphne Mezereum*, *Senecio paludosus;* while *Trifolium strictum*, *Filago gallica*, *Gladiolus communis*, *Leucojum æstivum*, *Crocus vernus*, and the like, adorn the fields of Llangollen. The fact that such lists can find purchasers (if they do so) causes melancholy reflections.

New Books.—H. Mayr, 'Die Waldungen von Nordamerika; ihre Holzarten' (München, Rieger: 8vo, pp. 448, tt. 10, 2 maps).—A. Murillo, 'Plantes Médicinales du Chili' (Paris: 4to, pp. 234).—A. Migout, 'Flore du Département de l'Allier,' ed. 2. (Moulins, Fudez: 8vo, pp. xxxvi. 509: 10 *fr.*).—F. R. Kjellman, 'Handbok i Skandinaviens Hafsalgflora: I. Fucoideæ' (Stockholm, Lamms: 8vo, pp. 103, 17 cuts).—O. Kirchner, 'Die Krankheiten und Beschädigungen unserer landwirtschaftlichen Kulturpflanzen' (Stuttgart, Ulmer: 8vo, pp. x. 637: 9 *marks*).—J. Murr, 'Die Pflanzenwelt in der Griechischen Mythologie' (Innsbruck, Wagner: 8vo, pp. viii. 324).—F. Höfer & M. Kronfeld, 'Die Volksnamen der niederösterreichischen Pflanzen' (Wien, Siedel: 8vo, pp. 105).—F. Pax, 'Allgemeine Morphologie der Pflanzen' (Stuttgart, Enke: 8vo, pp. 404, 126 cuts).

Articles in Journals.

Bot. Centralblatt. (Nos. 30, 31).—P. Kunth, G. C. Schelhammer, & J. C. Lischwitz, 'Zwei Kieler Botaniker des 17 bez. des 18 Jahrhunderts.' — (Nos. 30–35). K. Leist, 'Zur vergleichenden Anatomie der Saxifragen.' — (No. 31). E. Loew, 'Ueber die Bestäubungseinrichtungen von *Viscum album*.' — (No. 35). S. Nawaschin, 'Was sind eigentlich die sogenannten Mikrosporen der Torfmoose?'

Bot. Gazette (July 22). — E. J. Hill, 'Flora of Lake Superior Region.'—G. F. Atkinson, 'A new *Ramularia* (*R. areola*) on Cotton.' — J. E. Humphrey, 'Notes on Technique.' — A. L. Kean, 'The nature of certain plant-diseases.'—W. M. Andrews, 'Apical growth in roots of *Marsilia quadrifolia* and *Equisetum arvense*.'

Bot. Zeitung (Nos. 29-32).—L. Jost, 'Die Zeklüftungen einiger Rhizome und Wurzeln.' — (Nos. 33, 34). M. W. Beyerinck. 'L. Beissner's Untersuchungen bezüglich der Retinosporafrage.'

Bull. Soc. Bot. France (xxxvi. Actes du Congrès, 1889: Aug. 1). —L. Bescherelle & R. Spruce, 'Hépatiques nouvelles des colonies françaises.' — R. Spruce, 'Hepaticæ novæ americanæ tropicæ' (5 plates).—P. F. Reinsch, 'Introduction d'une échelle universelle de grossisement des figures microscopiques.' — M. M. Hartog, 'Technique applicable â l'étude des Saprolégniées.' — D. Clos, 'Lobations ou anomalies de feuilles simples.' — E. Roze, 'L'action de la chaleur solaire sur les enveloppes florales.' — —. Léviellée, 'Observations physiologiques sur un *Œnothera* des Neilgheries.'— T. Durand, 'Un nouveau genre des Liliacées' (*Lindneria*: 1 plate). — —. Battandier, 'Plantes d'Algerie rares, nouvelles, ou peu connues' (*Camelina Soulieri, Vicia mauritanica, Carduncellus Rebondianus, Hypochæris Claryi, Plantago atlantica*, spp. nn.).

Bull. Torrey Bot. Club (Aug.).—W. E. Wheelock, 'Descriptive List of species of *Heucheria*' (*H. Nova-Mexicana*, sp. n.).—H. H. Rusby, 'George Thurber' (2 Sept. 1821—2 April, 1890). — N. L. Britton, Rusby's S. American Plants (*Clidema cordata* Cogn., *C. Rusbyi, C. pilosissima, Œnothera coccinea, Fuchsia boliviana, Casearia membranacea*, spp. nn.). — D. C. Eaton, *Cheilanthes Brandegeei*, sp. n. (1 plate).—T. C. Porter, *Asplenium fontanum* in N. America.

Gardeners' Chronicle (July 26). — *Hemerocallis Thunbergii* Baker, *H. aurantiaca* Baker, *Maxillaria longisepala* Rolfe, spp. nn. — J. M. Macfarlane, '*Cytisus Adami*.' — (Aug. 2). *Gladiolus primulinus* Baker, n. sp. — R. A. Rolfe, *Epidendrum vitellinum flore pleno*.— 'Green-flowered Antirrhinums' (fig. 20).— (Aug. 9). *Pelargonium saxifragoides* N. E. Br., sp. n.— (Aug. 16). *Masdevallia costaricensis* Rolfe, *Nidularium striatum* Baker. spp. nn.—(Aug. 23). *Coryanthes Bungerothii* Rolfe, n. sp.

Journal de Botanique (June 16–July).—C. Sauvageau, 'Structure des feuilles des plantes aquatiques.' — G. Poirault, 'Les Urédinées et leurs plantes nourricières.'—(July). N. Patouillard, 'Fragments mycologiques.' — A. Prunet, 'Sur les bourgeons dormants des plantes ligneuses.'

La Nuova Notarisia (Aug. 1). — G. B. De Toni, 'Frammenti algologici' (*Œdogonium ciliare, Terpsinoë musica, Wildemania*, gen. nov.).—'Diagnoses Algarum novarum.'

Notarisia (June 30). — P. Hariot, 'Le genre *Bulbotrichia*.'— O. E. Imhof, 'Sulle diatomee pelagiche dei laghi. — P. Dangeard, 'Indication sur la récolte des algues inférieures.'—D. Levi Morenos, 'Quelques idées sur l'évolution défensive des Diatomées.' — P. Magnus, 'Sulla diffusione geografica della *Sphæroplea annulina*.'— M. Lanzi, 'Diatomacearum naturalis et methodicæ distributionis specimen.'

Oesterr. Bot. Zeitschrift. (Aug.). — L. Celakovsky, *Petasites Kablikianus* Tausch.—L. Angerer, 'Beitrag zur Laubmoosflora von Oberösterreich.' — J. Dörfler, 'Beiträge und Berichtigungen zur Gefässkryptogamenflora der Bukowina.' — J. Freyn, 'Plantæ Karoanæ.'

JOHN RALFS.

(With ~~Portrait~~.)

Only those who have come into close contact with the man or have carefully studied his works, can realize the greatness of the intellect of the veteran botanist who died at Penzance in July last. Had not his health and eyesight failed, there is little doubt that John Ralfs would have ranked as one of the greatest botanists of the century. His clearness of perception, his conciseness and exactitude of expression, added to his indomitable energy, his enthusiasm, and his wonderful memory, made him the very ideal of a naturalist.

He was born on Sept. 13th, 1807, at Millbrook, near Southampton. He came of an old Hampshire family, being the second son of Samuel Ralfs, of Mudeford, near Christchurch. His father died in 1808, and the young family was brought up by the mother, who disposed of the property at Mudeford, and removed to Southampton. Young Ralfs's first school appears to have been that of Dr. Buller in this town, he afterwards went to Mr. Jennings's at Bishop's Waltham, and subsequently to the Rev. J. Jenvey's at Romsey. To the last-named gentleman he became much attached, and to him he dedicated his first botanical book. As a lad Ralfs was studious and painstaking, and showed an early inclination to scientific pursuits, which first developed in the direction of chemistry. At about the age of eighteen he was articled to his uncle, a surgeon at Brentford, with whom he remained two years and a half, after which he studied at Winchester Hospital for two years. In 1832 he passed the examination qualifying him as a surgeon, and in this examination we find he distinguished himself by his knowledge of botany. He went into partnership with a surgeon in Shoreditch, and Mr. Marquand tells us that he practised at Towcester. During the few years that he was able to follow his profession he was very successful. While on a visit to Torquay he became acquainted with Miss Laura Cecilia Newman, daughter of Mr. Henry Newman, of London, and in 1835 was married to that lady. They had one son, John Henry, who was born in 1836. The marriage did not prove a happy one, for within two years Mrs. Ralfs (with her infant son) went to live with her parents, who were then residing in France; she afterwards travelled in Italy, but returned to France, where she died in 1848.

In 1837 Mr. Ralfs's health became so bad—his lungs being found to be seriously affected—that he was obliged to relinquish his practice and to reside in one of the health-resorts of the south-western coast. After visiting Torquay, he settled down, in Nov. 1837, at Penzance, which continued to be his home during the rest of his life, In 1838 he contributed the botanical portion of a guide to Ilfracombe by Banfield. In 1839 he published his first book, 'The British Phænogamous Plants and Ferns; arranged on the Linnæan System, and analysed after the method of Lamarck'; this consisted of a dichotomous key to the genera and species, with an analysis of the natural orders. It did not pretend to compete with the larger "Floras," but was intended as a guide to the quick determination of species; and the simple straightforward language employed, the judicious selection of practical characters, and the small compass of the book admirably adapted it to the purposes of a pocket manual. At the commencement of 1841 Mr. Ralfs opened a correspondence with the Rev. M. J. Berkeley, whom he had met some years previously; this resulted in a close friendship, and Ralfs and Berkeley appear to have constantly consulted one another on questions connected with the Algæ and Fungi. Berkeley's correspondence (preserved in the Botanical Department of the British Museum) contains some hundreds of letters from Ralfs, many of them consisting of four closely-written quarto pages, and containing pen-and-ink drawings. Ralfs seemed then to have settled down to the study of the Desmids and Diatoms, but continued to give a general attention to Fungi and other plants.

The summers of 1841 and several subsequent years were spent in visits to Ilfracombe and various parts of Wales, his longest stay usually being at Dolgelly. In 1842 he was accompanied on his Welsh trip by Borrer. In this year Ralfs sent a description of *Desmidium compressum* (a new species) to Dr. Balfour for the Botanical Society of Edinburgh. In 1843-4-5 he contributed to the same Society a series of papers on the Desmids and Diatoms, and in one of them he mentions that the total number of Desmids previously recorded in the British Floras was four—two *Desmidia* and two *Euastra*. These papers were published in the 'Annals of Natural History' and in the 'Transactions' of the Society. They contain figures and descriptions of a number of species of Diatoms, and over sixty Desmids, of which sixteen were new. In 1845 also appeared his paper, "On the genera *Spirulina* and *Coleochæte*," A. N. H. xvi. p. 308.

During this period Hassall was working at the *Confervæ*, and corresponded with Ralfs, who in his first letter suggested that they should render each other assistance in their respective fields of work; and the correspondence was carried on under the impression, on Ralfs's part, that this was a definite understanding. In 1844 he was much surprised, on receiving the prospectus of Hassall's forthcoming book, to find that it was intended to include the Desmids and Diatoms. A suggestion appears to have been made by a friend of both that the book should be written jointly; but it seems that Hassall would not hear of this, and considered himself very badly used because Ralfs was not inclined to hand over all his information on the Diatoms and Desmids for publication under Hassall's name; and in one of his letters to Berkeley he remarked that Ralfs was the most unreasonable man that he ever had to do with. In the work which appeared in 1845, are evident copies, and vilely bad ones, of Ralfs's figures in the 'Annals,' with "Hassall del." at the foot of the plates. In the Introduction, while acknowledging indebtedness to Berkeley and others, not a word was said of what was owed to Ralfs's work. Hassall was the only man of whom we recollect Mr. Ralfs speaking with any degree of bitterness.

In 1845 Ralfs was apparently suffering from the results of a severe accident, for, from a letter written from Brislington, we find that he was on a visit to Dr. Fox, with a view to consulting the Bristol surgeon, and was then better and able to get about with one crutch. For many years afterwards his health was so bad that he was often unable to do any botanical work for months together.

In 1848, after several delays occasioned by illness, his great work was published, 'The British Desmidieæ,' probably the finest monograph which has appeared of any group of British plants. The descriptions are complete and lucid, the synonymy is very carefully worked out, and the analyses are in Ralfs's characteristically terse style. Particular attention is given to the reproductive states of the plants, which had been previously observed in very few species. An appendix contains descriptions of the species not known to occur in Britain, and the small number of these is an evidence of the leading position Ralfs had taken up as an authority upon the group. In a few years he had raised the number of known British Desmids from four to a hundred and eighty. Mr. E. Jenner's beautiful drawings contributed much to the value of the work, for he was not only an excellent draughtsman, but a good botanist, and well acquainted with the Desmids. During the preparation of the work Ralfs had extensive correspondence with Brébisson, Kützing, Montagne, and other leading foreign algologists. Berkeley seems to have been of great assistance in many ways.

In the autumn of 1849, writing to Mr. Berkeley from Ilfracombe, Ralfs says:—"I have done very little this summer, as I have enjoyed but very few days of sufficient health to go out." During the year, however, he sent two short papers to the Edinburgh Bot. Soc., "On the mode of growth of *Oscillatoria*, *Calothrix*," &c. In 1850 he contributed to the same Society a paper on the *Nostochineæ*, with figures and descriptions of twenty-two species. In this year he went to France on a visit to the Count and Countess de Morambert, friends of his late wife, who had recently died at their Chateau in the Dordogne. During his stay in France he visited Brébisson and Lenormand, and when at Paris he made the personal acquaintance of Decaisne, Thuret, and Montagne. In 1851 he contributed another paper to the Edinburgh Bot. Soc., "On *Chantransia*."

In 1856 he undertook the arrangement of the Diatoms and Desmids for the fourth edition of Pritchard's 'Infusoria,' but, through repeated illnesses, was only able to complete the *Diatomaceæ*, and this contributed to the delay in the publication of the book, which did not appear until 1861. His work, however, was very thorough, and gave an account of the whole of the known Diatomaceæ, both recent and fossil.

The sudden failure of his eyesight about this time rendered future microscopical research impossible, thus putting a stop to the great work of his life, and he does not seem to have recovered from the shock for many years. He turned his attention more and more to working out the Flora of West Cornwall. In 1880, when the Penzance Nat. Hist. Soc. was resuscitated, he took a leading part in its proceedings, and contributed a number of papers on the Flora of the Vice-county. To the Fungi he gave special attention, and recorded nearly seven hundred species, most of which were verified by Berkeley and Broome. In 1883–4 he was President of the Society. He recorded in the Report for 1887–8 his last additions to the Flora.

He always took a great interest in the Penzance Public Library, and in 1870 we learn from a letter to Broome that he was engaged in making a "shelf-book," containing a list of the 12,000 volumes included in the library. To this institution he presented his MS. Flora of the Vice-county of West Cornwall, in nine volumes, containing the result of his own fifty years' observations, besides notes received from others.

In addition to the works already mentioned, we understand that Ralfs contributed jointly with the Rev. H. Penneck, "A Sketch of the Botany of West Penwith," to Courtney's 'Guide to Penzance': and that he also contributed to Blight's 'Week at the Land's End.' Fifteen papers stand under his name in the Royal Society's 'Catalogue of Scientific Papers.' He supplied the list of Desmids to Jenner's 'Flora of Tunbridge Wells,' and issued a fasciculus of Algæ: he also described an alga (*Tyndaridea anomala*) for the 'Supplement to English Botany,' t. 2899.

In 1889 the Royal Microscopical Society somewhat tardily recognised his eminent services to microscopical science by electing him an Honorary Fellow. Many years ago it was proposed to nominate him as an Associate of the Linnean Society, but this he declined. Berkeley gave the name of *Ralfsia* to a genus of Seaweeds, and Wilson named a *Jungermannia* in his honour.

During the last few years of his life increasing deafness and other infirmities, and frequent attacks of bronchitis, confined him almost entirely to the house. Fortunately he was well cared for by Miss Quick, in whose house he had lived for many years; indeed, no relative could have been kinder or more devoted to him. He died on July 14th, 1890, and was buried in the Penzance Cemetery.

We first made his personal acquaintance when visiting Penzance in 1880, and we shall not forget the cordial way in which he received us, nor the pleasant evenings we spent in his characteristic naturalist's den, with its walls covered with books, and its general litter of specimens and papers dimly discernible through the cloud of tobacco-smoke—for Ralfs was an inveterate smoker. He took a great deal of trouble to show us the localities of botanical interest in the district, and no youthful naturalist could have been more enthusiastic than he was in field work. At that time he was engaged in collecting beetles for Mr. Marquand's list, and his joy at finding a species new to the district was so contagious as to make one want to start as a beetle-collector on the spot. It was amusing to notice the wonder of a passer-by at seeing this grave looking old gentleman, in the old-time professional swallow-tail coat and black stock (which he never relinquished), squatting down by a road side pool, eagerly examining the contents of his dredging-net, and utterly oblivious of the muddy water dripping over his clothes.

He was well known and much respected in Penzance and its neighbourhood, and his kindly unselfish character endeared him to his many friends. He has been described as of a retiring and silent nature, but we cannot help thinking that those who took this view knew but little of him: to us he appeared to be a man of a particularly hospitable and sociable disposition, and the ready flow of humorously-told anecdotes of his experiences during his botanical expeditions did not suggest a silent man. He was very fond of children and young people, and often referred, in his letters, to being assisted in collecting by young friends. The death of one of these, Miss Minnie Cocking, seems to have much affected him, for in a letter to Mr. Broome he wrote:—"It has been a sad Christmas for me. I do not know whether you remember my speaking to two young girls one day in the library. One of them took fever, and to-day was buried. I was very fond of her—she was such a dear, merry, affectionate little creature, and as good as she was pleasing. I knew her from an infant, and few days passed without seeing her." Although particularly simple and unaffected in manner, there was a rare dignity about the man that could not fail to impress all with whom he came in contact.

Mr. Ralfs bequeathed his collections of microscopic plants to the Botanical Department of the British Museum, but his will was not witnessed, and had consequently no legal force. His son has, however, in consideration of his father's wishes, generously resolved to place the collection in the British Museum.

The portrait which we reproduce is from an excellent photograph taken some eight years ago by Mr. R. H. Preston, of Penzance. For the biographical information we are largely indebted to our friend Mr. E. D. Marquand, who lived for some years at Penzance, and whose genial companionship did much to brighten the later years of Mr. Ralfs's life. We are also indebted to Mr. Ralfs's son, Mr. J. H. Ralfs, of Liverpool, and to Miss Nicholls and Mr. Henwood Teague, of Penzance.

H. & J. Groves.

PLANTS DESCRIBED BY ARDUINO (1759—1763).

By F. N. Williams, F.L.S.

In tracing back the early history of some of the *Caryophylleæ*, I was led to inquire into the identity of Arduino's species, and the priority of his names; the result of this inquiry is embodied in the present paper. Among the few important botanical works published between the second edition of Linnæus' 'Flora Suecica' (1755) and the second edition of the 'Species Plantarum' (1762) was the first instalment of Peter Arduino's 'Animadversionum Botanicarum Specimen,' which was published at Padua in 1759. This little-known book (in which the smooth latinity of the author's style is in pleasing contrast with the angular pseudo-classicism of some contemporary works) contains descriptions, accompanied with excellent figures, of twelve species. The binomial nomenclature is not adopted, but each plant is cited under its generic name, followed by a specific phrase. The following list gives the names of the species with which these plants are now identified:—

1. Salvia sp. I. = *S. disermas* Linn. Sp. Plant. ed. 2, p. 36.
2. Salvia sp. II. = *S. serotina* Linn. Mantissa, p. 25.
3. Teucrium sp. I. = *T. Arduini* Linn. Mantissa, p. 81.
4. Teucrium sp. II. = *T. hircanicum* Linn. Sp. Plant. ed. 2, p. 789.
5. Chelone sp. = *Pentstemon lævigata* Ait. Hort. Kew, ii. p. 361.
6. Clypeola sp. = *Peltaria alliacea* Jacq. Enum. Stirp. Vindob. p. 260 (1762).
7. Alyssum sp. = *A. saxatile* Linn. Sp. Plant. ed. 1, p. 650.
8. Lepidium sp. = *L. cardamines* Linn. Sp. Plant. ed. 2, p. 899.
9. Sinapis sp. I. = *S. pubescens* Linn. Mantissa, p. 95.
10. Sinapis sp. II. = *S. chinensis* Linn. Mantissa, p. 95.
11. Psoralea sp. = *P. glandulosa* Linn. Sp. Plant. ed. 2, p. 1075.
12. Buphthalmum sp. = *Telekia speciosissima* Less. Syn. Gen. Comp. p. 209 (1832).

The second instalment of the 'Animadversionum Botanicarum Specimen' was published at Venice in 1763; between the publication of the second edition of Linnæus' 'Species Plantarum' and the appearance of the first part of the 'Mantissa Plantarum' (1767). And herein lies the importance of the date, because several of Arduino's plants have been almost invariably erroneously credited to Linnæus. In this second instalment, in which the binomial nomenclature is adopted, twenty-three species are figured and described. Two of these, *Sagina procumbens* and *Bidens bullata*, are excerpted with due acknowledgment from the 'Species Plantarum'; the other twenty-one are described as new. In the following list, the first column contains the names of Arduino's species, and the second column either the erroneous name more frequently cited for the earlier species, or the present correct name. As in the list above, the correct specific name is in italic type:—

1. Cornelia verticillata = *Ammannia verticillata* Lam. Encycl. Meth. 1, p. 131 (1789).
2. *Salvia ceratophylloides* = S. ceratophylloides Linn. (1767).
3. *Valeriana supina* = V. supina Linn. (1767).
4. Panicum undulatifolium = *Oplismenus undulatifolius* Roem. et Schult. Syst. Veget. ii. p. 482 (1817).
5. Panicum oryzoides = *Leersia oryzoides* Swartz, Prodr. p. 21 (1788).
6. *Melica Brasiliana* = M. papilionacea Linn. (1767).
7. *Sesleria cærulea* = Cynosurus cæruleus Linn. Sp. Pl. ed. 1, p. 72.
8. *Sesleria sphærocephala* = Cynosurus sphærocephalus Wulf. in Jacq. Misc. Austriaca (1781).
9. *Sagina apetala* = S. apetala Linn. (1767).
10. Saponaria illyrica = *Tunica illyrica* Fisch. et Mey. Ind. Sem. Hort. Petropolit. (1837).
11. Arenaria graminifolia = *Alsine graminifolia* Gmel. Syst. Veget. i. p. 507 (1796).
12. *Cerastium illyricum* = C. pilosum S. et S. (1806).
13. *Anemone decapetala* = A. decapetala Linn. (1767).
14. Melissa maxima = *Perilla ocimoides* Spreng. Syst. Veget. iv. 2, p. 227 (1827).
15. *Alyssum petræum* = A. gemonense Linn. (1767).

16. *Alyssum orientale* = Clypeola tomentosa Linn. Mantissa (1767).
17. *Thlaspi minimum* = T. alpinum Jacq. Fl. Austriaca, iii. (1778).
18. *Lepidium spinosum* = L. spinosum Linn. (1767).
19. Prenanthes chondrilloides = *Chondrilla prenanthoides* Vill. Voy. Bot. Suisse (1812).
20. Cacalia linifolia = *Porophyllum linifolium* DC. Prodr. v. p. 649 (1836).
21. Eupatorium alternifolium = *Kuhnia eupatorioides* Linn. Sp. Pl. ed. 2, p. 1662.

The only other memoir by Arduino of any importance is an essay on the genus *Holcus*. He was born in 1728, and died in 1805.

BUDA v. *TISSA*.

By the Editor.

My note at p. 157 elicited a rejoinder from Dr. Britton which did not seem to me to add much to what had been already said, and I wrote to the author to say that I did not propose to print it. Dr. Britton, in the 'Botanical Gazette' for July, publishes another note on the subject, in which he so far forgets the ordinary amenities of discussion as to say that I did not print his communication, "apparently because afraid of the argument therein contained." I cannot suppose that the lines upon which the 'Bulletin of the Torrey Botanical Club' is edited suggested this to Dr. Britton; but they certainly are not those which regulate the conduct of this Journal. Dr. Britton's note is as follows: readers will form their own opinion as to whether its "argument" is of so convincing a kind as to have caused me to withhold it from publication:—

"Tissa *v.* Buda.—Mr. Britten has abstained so long from comment on what he is pleased to call 'eccentricities of the neo-American school of nomenclature' that we had begun to suspect him converted to a rational system. But his recent note (Journ. Bot. xxviii. 157) indicates that he is still pursuing the unbroken error of his way. I accepted *Tissa* rather than *Buda* for the simple reason that it stands first on the page in Adanson's 'Familles.' That is priority, I am sure. The fact that Dumortier had named some species under *Buda* has, to me, nothing to do with the case. Mr. Britten's argument is quite as good for the use of *Spergularia* or *Lepigonum*; species have been named under both by numerous authors. The restoration of *Tissa*, which Mr. Britten attributes to Professor Greene (1888), is as well referable to M. Baillon ('Histoire,' ix. 116, 1888). As I have already noted, the name is taken up in Engler & Prantl's new work, so that the 'neo-American' school is not altogether unsupported in its 'eccentricities.' If it were not for the limited space of the Journal, I might write at greater length concerning the very general adoption by American botanists of the principles of nomenclature recommended by the British and American Associations for the Advancement of Science, which are undoubtedly included in my good friend's 'eccentric' category.—N. L. Britton."

At the risk of trying the patience of the readers of this Journal, I will once more point out the exact position of the two names in question. This is how Adanson prints them:—

"Page 271, après *Spergula*, ajoutez :

	Feuilles.	Fleurs.	Calice.	Corolle.	Etamines.	Pistil.	Fruit.	Graines.
Tissa. Adans. Alsine flosculo subcæruleo. C. B.	O posées	Solit. axill.	5 feuill.	5 pétales	5	3 stil. 3 stig.	Capsule 1 loge, 3 valves.	Sphériques.
Buda, Adans. Alsine Spergula major, semine foliaceo. Mor. Dill. Eph. Nat. Cent. 5. n. [?] *4.*	Id.	Id.	Id.	Id.	10	Id.	Id.	Orbicul. "

Adanson, 'Familles des Plantes,' ii. 507 (1773).

Every one is agreed that these two genera antedate *Lepigonum* and *Spergularia*, and that they should be united: and the natural course undoubtedly would have been to take up the former of them. But this course did not recommend itself to Dumortier, who was the first to direct attention to Adanson's names, and who ('Flora Belgica,' 110 (1827)) deliberately adopted the latter for the combined genus,* thus:—

"Buda.—B. et Tissa. *Adans.*
1422. rubra = Arenaria, L. I. 6–8. In pascuis sabulosis!
1423. marina = Arenaria, L. I. 6–8. In humidis salsis!
1424. media = Arenaria, L. I. 6–8. In humidis salsis!"

So matters remained until 1888, when Prof. Greene (and, as Dr. Britton points out, Prof. Baillon) restored *Tissa*, and were followed by Dr. Britton (Bull. Torrey Club, xvi. 126, 1889).

Against this restitution I protested in this Journal for 1888 (p. 261), and again at p. 158 of the present volume; for when pointing out that Prof. Trelease, in criticising Dr. Sereno Watson's preference for *Tissa*, had misstated the position of the names in Adanson's book, I also showed that the increased synonymy is due to those who deliberately ignored Dumortier's restoration.

It now appears that the old-fashioned view that the law of priority has reference to date of publication is to be superseded. "I accepted *Tissa* rather than *Buda*," says Dr. Britton, "for the

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* In so doing he was acting in perfect accordance with the Decandollean 'Lois':—"*Art. 55.* Dans le cas de réunion de deux ou plusieurs groupes de même nature, le nom le plus ancien subsiste. *Si les noms sont de même date, l'auteur choisit.*" This common-sense rule has, so far as I know, never been called in question; and it is reprinted without comment or alteration in the second edition of the 'Lois.'

6.11 DC (1891)

Adanson Famille des plantes

partie II.

MDCCLXIII 1763.

m. III [illegible]

page 507 il dit : page 271, après Spergula, ajoutez :

puis suit une dans Journ. of Bot.

à la pages 270-271 Adanson a les Spergula et il dit (p. 271).

Spergula Dod. 527	feuilles opposées & verticillées	fleurs solit. ou en corymb. term.	calice 5 feuilles	corolle 5 petales	Etam. 10	Pistil 5 styles 5 stigmates	fruit capsule à 1 loge 5 valves	graines spheriques et plates

simple reason that it stands first on the page in Adanson's 'Familles.' *That is priority, I am sure.*"

This being so, and supposing that this new definition of priority of publication is accepted, let us see where it will lead us.

In the first edition of his 'Genera,' Linnæus establishes *Prunus* and *Amygdalus*. The latter is, by Bentham and Hooker and by most other recent systematists, united with the former. But a reference to the 'Genera' will show that, on Brittonian principles, it is *Amygdalus*, not *Prunus*, that must be retained; for the former is numbered 519 while the latter is numbered 520, and stands, not "first on the page," but on the page preceding! "This," I imagine Dr. Britton will say, "is priority, I am sure. The fact that everybody, from Linnæus himself downwards, has named some species under *Prunus* has, to me, nothing to do with the case. Henceforward *Amygdalus*, and not *Prunus*, must have precedence: and our species of *Prunus* shall run

Amygdalus Padus (Linn.) Britton.
A. virginiana (Linn.) Britton.

and the like. This is the 'rational system' of nomenclature, which I have providentially been raised up to expound."

Joking apart, it seems to me clear that, if Dr. Britton's "arguments" for the suppression of *Buda* for *Tissa* are to prevail, it is impossible to avoid applying them in the numerous cases similar to that which I have cited from Linnæus. It is for botanists to decide how far they will go in countenancing what I must again call "the eccentricities of the neo-American school of nomenclature," and also whether this definition or Dr. Britton's alternative one of "a rational system" best fits the case. The material for judgment is now before them, and I do not propose to return to the subject.

THE NOMENCLATURE OF POTAMOGETONS.

By Arthur Bennett, F.L.S.

From time to time I hope to call attention to the names, synonymy, &c., of some of the species of this genus, mainly, I must confess, with a view to gain information, especially as to authentic or type specimens, wherever such may be in existence. I shall be greatly obliged for any corrections, should these be necessary.

"Potamogeton intricatus Nolte." — Is it known where Nolte described this (if he did so)? Herr v. Uechtritz, on a label accompanying specimens of "*P. Berchtoldii* Fieber," has written "an *intricatus* Nolte?" No such a name is found among Nolte's specimens at the British Museum Herbarium; has any one any knowledge of it?

P. Spirillus Tuckerman in Sill. Journal, 2nd ser. vi. 228 (1848). — This is *P. porcatum* Muhlenberg, Cat. Plant. Am. Sept. No. 3, 1813. In Sir J. E. Smith's herbarium there is a specimen from Muhlenberg, named "*P. porcatum*, No. 54, 1793. Pennsylvania." It has received several names; among others:—*P. Zetterstedtii* Wallman ap. Sch. et Mohl. Bot. Zeit. i. 256 (1843); *P. diversifolius* Rafinesque, Medical Reports, ii. 46, 1811, non Barton; *P. delicatulus* Bert. Misc. Bot. 15 (1854); *Zannichellia Cochlospermum* Al. Braun in Herb. Berlin!; *Spirillus Tuckermanii* Gay in Herb. Kew!; *Cochlosperma* Nuttall Herb., *fide* Trimen, Journ. Bot. 1879, 314.

P. PAUCIFLORUS Pursh. Fl. Amer. Sept. i. p. 121 (1814). *P. foliorum* Rafinesque, Medical Reports, 46, 1811. "*P. gram.* Michx. Fl. Bor. Am. nec non Linn.," Rafinesque, *l. c.* — This is *P. exstipulatum* Muhl. Cat. Pl. Am. Sept. No. 8, in Herb. Willd. n. 3206, fol. 1-3! (1813). — I am not aware that Muhlenberg published any description of it; if he did so before 1814, his name will take precedence. *P. exstipulatus* Bonpland MS. is *P. angustifolius* H. B. K. Nov. Gen. et Sp. i. 370, and is to be referred to *P. pectinatus* (aggregate). It is contained in Herb. Willdenow at Berlin, No. 3206, f. 4, 5.

P. MEXICANUS Ar. Benn. Journ. Bot. 1887, 289. — This was named *P. peruviana* by Presl (ined.) in Herb. Prague!

P. ANGUSTIFOLIUS Presl.—The date of this is 1821, as I supposed (Journ. Bot. 1889, 263): fascicles 1-10 of the 'Rostlin' were published in that year; Roth's name *P. Zizii* (1827) is thus antedated by six years.

P. RUFESCENS Schrad. — In writing of this (Journ. Bot. 1889, 243) I expressed an opinion that Roth's *serratus* (Fl. Germ. i. 73, and ii. 205 (1788-1800)) from his reference to the plate in Fl. Danica must be *lucens*, but he also refers under *lucens* to the same plate, so it must have been a slip; and the *serratus* of the Beitrage (ii. 126, 1783) most certainly, from the description, applies to *rufescens*.

P. WRIGHTII Morong, Bull. Tor. Bot. Soc. (1886) xiii. 158, t. 59. *P. mucronatus* Presl, Epimeliæ Botanicæ, p. 245 (1849), non auct. —This is No. 1381 of Cuming's plants from the Philippine Islands. There is no doubt Morong's name is preoccupied by *P. malaina* Miquel, Ill. Fl. Arch. Ind. p. 46 (1871). A very poor and imperfect specimen, communicated by Dr. Buchenau from Kashmir, W. Himalaya, alt. 5800 ft. (Schlagintweit, 9 Cat. No. 10449), I believe to be the same, though there is neither flowers or fruit. It is named *fluitans*, which it is not. The fruit of *P. Wrightii* is very distinct and characteristic.

P. LIEBMANNI Buchenau, Nat. Ver. Bremen, iii. 349 (1873).— An authentic specimen of this plant, gathered by Liebman, and communicated by Dr. Buchenau, is *Schollera graminea* Willd. = *Heteranthera graminea* Vahl.; so it would seem that this Mexican plant must be excluded from the genus.

P. JAVANICUS Hassk. — In this Journal for 1887, p. 177, I expressed an opinion that this might be different from *P. tenuicaulis* Mueller; but Dr. Schinz, of Zurich, who possesses a type specimen of *javanicus*, assures me they are the same species; the *P. parvifolia* Buch. must also certainly be referred to *javanicus*. The synonymy will be—

Potamogeton javanicus Hasskarl, Act. Soc. Ner. i. p. 26 (1856).

P. tenuicaulis F. Mueller, Frag. Phyt. Aust. i. 90 & 244 (1858).

P. parvifolia Buchenau, Reliq. Rutenberg. pp. 32–33 (1880). (Dr. Schinz would add *P. Huillensis* Welw., but I have myself not seen a fruiting specimen of this.)

P. hybridus? Hooker (non Michx.), Khasia, Herb. Kew!

Distribution:— India! China! Java! Madagascar! Niger Country! Australia!

Miquel (Illust. Fl. Arch. Ind. p. 46, 1871) remarks on the probability of *P. tenuicaulis* Muell. being *javanicus* Hassk., and notes that the same species is found in Japan (Prolusio. Fl. Japon. fasc. 7 p. 325, 1867). Mr. Bentham, Fl. Austr. vii. 171 (1878), remarks that Mueller had considered *javanicus* and *tenuicaulis* the same, but, in the absence of specimens of the Javan species, left it an open question. The Rev. T. Morong (Torrey Bulletin, 1886, p. 158) identified the Torrey herb., Formosan, and Indian plants as *tenuicaulis* Muell. Dr. Buchenau, when describing *P. parvifolia*, does not mention the Australian plant; he probably had not access to specimens of it, or he would have seen they were the same.

P. FILIFOLIUS R. A. Philippi, Florula Atacamensis, No. 357, 1860! — A specimen of this, kindly sent me by Prof. Philippi, proves the plant to be a *Ruppia*, which I hope he will name *R. atacamensis*.

P. FLABELLATUS Babington, Man. Brit. Bot. ed. 3, p. 343 (1851). —Mr. Fryer has taken a good deal of trouble to find out what was really meant by this plant, and the conclusion he has come to is that it is a more abundant plant than *P. pectinatus* type. From being mixed up with *pectinatus* forms by nearly every botanist, before Mr. Fryer's careful researches, it has been doubtful to what extent the name referred to a local (or perhaps endemic) form; hence certain comparison with continental forms was hardly possible. But the plant is contained in Willdenow's Herbarium at Berlin, No. 3204, f. 5! and this is the earliest I have as yet been able to trace it to; this is *P. interruptus* Kitaibel ap. Schultes, Oest. Flora, ed. 2, p. 328 (1814), the specimens being named by Kitaibel himself; the label runs thus:—"*P. subverticillatus* = *P. interruptus* mihi in stagnis salsis, Kitaibel." If considered a variety of *pectinatus* L., the earliest name I can find is *P. pectinatus* var. *dichotomus* Wallroth, Sched. Crit. p. 68 (1822). Dr. Kerner, recognising the difference between it and *pectinatus*, named it *P. juncifolius*! (cfr. Tiselius, Bot. Notiser, 1884, pp. 91–92). So Prof. Babington's name must become a synonym. Mr. Druce, in his 'Flora of Oxfordshire,' has "*P. junceus* K." I suppose he means *juncifolius* by this; but it was a pity to introduce another needless synonym, as Babington's name is far older than Kerner's.

P. GRACILIS Wolfgang, ap. Roem. et Schultes, Sys. Veg. Mant. 3, p. 355, 1827. — "Siberia orientali Merck in herb. Steven," Wolf. *l. c.* "Two specimens from Wolfgang are in the herbarium at Helsingfors," Dr. Kihlman *in litt.* Dr. Kihlman has named this plant *P. Wolfgangii* under the mistaken supposition that Fries' *P. gracilis* (Nov. Fl. Suec. ed. 2, p. 50, 1828) was an earlier name than Wolfgang's. Fries knew of the publication of Wolfgang's name (cfr. Nov. Fl. Suec. p. 26), and ignored it. I suggested to Dr. Kihlman that Fries' plant should bear the name of Nolte, but he declined to withdraw his name. Whether that is done, or not, Wolfgang's must stand as the oldest name. I would here propose that Fries' plant should bear the name of *P. Noltei* (after one who closely studied the genus) when considered a species. Almquist has already referred it as a variety to *pusillus* in Hartman's Hand. Skan. Fl. ed. 12, p. 54, 1889. The plant of Wolfgang has recently been found in Finland (Holmen, Kihlman, &c.!), and I am indebted to Prof. Maximowicz, of St. Petersburg, for a specimen from "Mongolia: Ordos. leg. G. N. Potanin, 1884," under the name of *P. gramineus* L. var. *mongolicus* Maxim. The uncertainty attending some of Wolfgang's species has led to their being relegated to "species dubiæ"; but, where specimens exist, the descriptions (incomplete undoubtedly) cannot be passed over. The *P. pumilus* of the same author I believe to be *P. Lonchites* Tuckerman, but I have not succeeded in seeing any specimen named by Wolfgang.

P. sibiricus, sp. nov. — "Potamogeton. . . . . Siberia orient. ad fl. Wilni, 64°. Exped. soc. geog. leg. R. Maack, 1854," in Herb. Acad. Petrop. C. J. de Maximowicz. Affinity with *P. obtusifolius* M. et K., and *P. acutifolius* Link, the venation of the leaves somewhat like the latter, fruiting spike like *obtusifolius*. The nervation is also somewhat like that of *P. ochreatus* Raoul, but in that the whole of the leaf is nearly alike in structure, and the nerves are connected by irregular zigzag transverse nerves; in *sibiricus* by straight ones at right angles to the other nerves, and the central half of the leaf is distinct in structure from the other.

P. SIBIRICUS mihi.— Stem compressed, 1 line broad, striated; with fascicles of leaves in the axils (much like *P. Friesii* has); stipules obtuse, pale, 6–9 lines long, 1–1½ line broad; nerves numerous, slender, running almost to the apex without anastomosing. Leaves all similar, sessile, linear, slightly narrowed to the base, biglandular; when young obtuse-mucronate, when mature acuminate-acute; 18–24 lines long, 1–1½ line broad, with 15–21 nerves; the central portion of the leaf (one half) showing as a distinct band, with the nerves much stouter, and connected by transverse nerves at right angles to the others, the outer ones much more slender, and only occasionally connected by transverse ones. Peduncles 9–12 lines long, gradually but slightly enlarged to the fruiting-spike; spike subglobose, dense, 12–16-flowered. Fruit greenish yellow, rugose (probably not quite mature), 1¼ line long, ½ line broad, compressed, 3-keeled, with the central keel less prominent than the outer ones, convex on the outer margin, nearly half-ovate on the inner (the base of the fruit in a straight line with the base of the beak), terminated by a stout recurved beak, with the central process occupying a much larger space than in *obtusifolius*, *acutifolius*, or *Friesii*. Embryo coiled to nearly two-thirds of a spiral. Habit between *obtusifolius* and *Friesii*, easily separated by the head of fruits from these and all other species known to me; the heads of fruit remind one at first glance of those of *P. Drummondii* Bentham.

P. Oakesianus Robbins in Gray's 'Manual of North United States,' ed. 5, p. 485 (1868). — I believe this to be the *P. Nuttalii* Cham. et Schl. (in 'Linnea,' ii. p. 226, 1827), and the *P. Purshii* (name only) of Tuckerman in 'Silliman's Journal,' 1848, p. 228.

P. alpinus Balb. × pensylvanicus Cham. — A plant sent by the Rev. T. Morong from "Lake Champlin, at Ferrisburgh, Vermont, U. S. Coll. C. E. Faxon, 18–8–82, supposed to be a form of *P. rufescens* Schrad." I would suggest this may be an hybrid. Mr. Fryer has remarked, "Why not *P. Griffithii?*" and I must allow the likeness to that plant is remarkable. Still I cannot certainly place it there; and I make the above suggestion as I am not able to place it elsewhere. Perhaps American botanists who may have the opportunity will study it growing.

P. ambyllphyllus Beck. and P. verticillatus Lesquereux, two fossil "species," had better be re-named, as bearing names applied to recent plants.

P. filiformis Nolte, Nov. Fl. Holsat. (1826). — It is not easy to decide what name this plant ought to bear. The following have been referred to it:—

P. pusillus fluitans Bocc. Ic. et Descrip. Rar. Sic., &c., p. 42, t. 20, fig. 5 (1674), *fide* Fries.

P. marinus L. Sp. Pl. ed. 1, p. 127 (1753), ex Auct. Suec. non Herb!

P. setaceum Schum. En. Pl. Saell. 1, No. 170 (1801)!

P. filiformis Persoon, Syn. Pl. 1, No. 16, p. 152 (1805), sec. Lange.

P. capillaceum Mörck in Herb. Mus. Brit. (1821)!

P. fasciculatus Wolf. ap. Roem. et Sch. Mant. 3, p. 365! (1827).

P. marinus All. ap. Reich. Ic. Fl. Germ. et Helv. vol. 7 (1844).

P. pectinatus subsp. *filiformis* Pers. (sp.), Hooker, Stud. Fl. Brit. Is. ed. 2, p. 397 (1878)!

P. filiformis var.? *cuscutiformis* Reich. in Herb. Mus. Brit.!

P. Bocconi Linn. in ind. It. Gottl. p. 221, *fide* Fries.

Is there any specimen of Boccone's plant at Vienna, or elsewhere? There is none in a collection of Boccone's at Paris (cfr. E. Bonnet, Bull. Soc. Bot. France, xxx. 213). If such a specimen exists, and it should prove to be *filiformis*, I see no other course than to adopt *marinus* L. as its name. Chamisso (Linnæa, ii. 174) says of Boccone's drawing, "mala icon"; doubtless, if it refers to *pusillus*, it is so: but one cannot avoid the impression that it really represents a small state of *filiformis*—like *fasciculatus* Wolfgang. Nolte says that his *filiformis* differs greatly from *P. marinus*, but no doubt he was here referring to Hartman's *marinus*, i. e., *P. zosteraceus* Fries, as I possess specimens of his own gathering and naming, which are clearly what we mean by *P. filiformis*. Gussone, Fl. Sic. Syn. 1, p. 208 (1842), refers Boccone's drawing to *P. trichoides* Cham., but if this correctly represents an actual specimen, that seems impossible. There is no specimen in the Linnean Herbarium that can be referred certainly to *filiformis*. At present it seems safer to use *filiformis* of Nolte as the name, as this is certain, definite, and open to no doubt. Nolte himself writes "*P. filiformis* Persoon," yet he does not put the sign ! as having seen Persoon's plant.

P. Friesii Rupr. Beit. zur Pl. d. Russ. Reich. 4, p. 43, 1845 !—The name of this plant, the *P. mucronatus* of authors (except Presl), is as difficult to settle as that of *filiformis* Nolte. Some of the names it appears under are given here:—

P. compressum Oeder, Flora Dan. t. 203 (1765)!; Roth, Beit. z. Bot. 2, p. 130 (1783).

P. acutifolius Presl, Fl. Cech. p. 37 (1819)!

P. compressum β. elongatum Wahl. Fl. Suec. 1, p. 107, 1824, *fide* Meyer.

P. pusillus L., var. *a*, Cham. et Sch. Linnæa, 2, 171–2 (1827)!

P. pusillus L., var. *major* Fries, Nov. Fl. Suec. p. 48 (1828)!

P. compressum Smith, Engl. Fl. 1, p. 234 (1828)!

P. pusillus var. *latifolius* Meyer, Ch. Hann. p. 525 (1836).

P. mucronatus Reich. Ic. Fl. Germ. et Helv. v. 7, 15 (1844), non Schrader?

P. Oederi Meyer, Fl. Hann. Excur. 1849.

P. acutifolius Meinshausen, Fl. Ing. Exsicc. 7, 613 (1861)!

? P. pusillus L., var. *interruptus* Schul. Oest. Fl. ed. 2 (1814).

(To be continued.)

SPERGULA PENTANDRA IN IRELAND?

By James Britten, F.L.S.

In the last number of the 'Annals of Botany,' Mr. Druce gives his reasons for considering *Spergula pentandra* an Irish plant. The greater part of his paper is occupied with a description of the species, "adopted from the Fl. Hispan. by Wilkomm et Lange," with bibliography and synonymy: but its chief interest lies in the evidence adduced for accepting the plant as native. This is thus stated by Mr. Druce:—"While recently engaged in examining the plants in the Dillenian Herbarium in the Oxford collection, I came upon a specimen of a *Spergula*, which from the seeds I saw was *S. pentandra*. It was labelled '351. 8 from G. Sherard': the number refers to the page and paragraph of the 3rd edition of Ray's Synopsis, and G. Sherard is William Sherard, the munificent donor of plants and endowments to the Oxford Botanic Garden, sometime Consul at Smyrna. . . . . In support of the contention that it is a native plant of Ireland we have the fact that the plant in question is true *S. pentandra*, that it is labelled 'collect. G. Sherard,' that it is preserved on the original numbered sheet, that it was in the sheet of the Dillenian herbarium corresponding to the pagination of his Synopsis, and the number on it agrees with the especial paragraph where the plant is so aptly described; and that we know Sherard visited several parts of Ireland, including Drogheda and the Mourne Mountains, in one of which places he most probably collected the plant in question."

The entry in the 'Synopsis,' on which rests the original claim of *S. pentandra* to appear in our Floras, runs:—"In Hibernia locis arenosis observavit Dr. G. Sherard." Its records in Britain are certainly erroneous, and this might have been more clearly stated by Mr. Druce. Thus he says:—"Sir James Smith in E. B. No. 1536 (1805), figured a plant which he called *S. pentandra* L., but which, as figured, is apparently a form of *S. arvensis* L." Mr. Druce does not seem to be aware that this plate is reproduced in the 3rd edition of 'English Botany,' t. 253, and cited by Syme as *S. arvensis*, var. *sativa*, which it undoubtedly represents. Mr. Druce's quotation from 'Comp. Cyb. Brit.' iii. 490, is hardly accurate: he cites:—"Watson says, '*S. pentandra* Sm. non Linn., Bedford, Lancashire,' and identifies it (with his usual acumen) with the var. *vulgaris* [Boenn.] Syme ii. 127." Mr. Watson wrote:—"*Spergula* (*arvensis*) *pentandra* Sm. (not of Linn.). . . . . Bedford. Lancaster. . . . . *S. arvensis* var. *vulgaris*; Eng. Bot. ii. 127." No one doubts Mr. Watson's "acumen," but on this occasion he is simply citing Syme's determination.

It would be easy to quote other records of this *Spergula* as a British plant, but in every case it is practically certain that a form of *S. arvensis* was intended. Whether Mr. Druce's evidence is sufficient to establish its claims to be considered Irish, each one must decide for himself. Mr. Druce writes:—"Stokes, in Withering, 1787, vol. i. p. 482, says it is much like *S. arvensis* but smoother, and simply quotes Sherard's locality." But here I must again demur (as in other instances which might be mentioned) to his citation: for the first half of this sentence is merely quoted by Stokes from Linnæus, and he does not mention either Sherard or his locality. Stokes does say, however:—"The botanists of Ireland may enable us to ascertain" more about it; and I think his words may fitly apply now. The 'Cybele Hibernica' says, "*Spergula pentandra*, supposed to have been found in Ireland by Sherard, was, in all probability, a species of *Lepigonum*." Mr. A. G. More will be able to tell us whether he has subsequently modified his opinion.

THE FERTILISATION OF THE SUGAR-CANE.

We are indebted to the kindness of Dr. Fressanges, formerly President of the Medical Society of Mauritius, for a copy of the 'Revue Historique et Litteraire de l'Ile Maurice,' for April 23rd, 1890, which contains a communication from his pen on the fertilisation of the Sugar-cane, read before the Society on the 12th of November, 1884. The letter from which we extract the following is of great interest, especially when viewed in the light of recent researches. There seems little doubt that Dr. Fressanges really has seen and figured the germination *in situ* of the Sugar-cane; but it is to be regretted that he did not obtain and describe the actual seed, which would have placed his discovery absolutely beyond question. This, unfortunately, he did not do.

"Port Louis, Nov. 12th, 1884.

"At the last sitting but one I made a communication to you on the fertilisation of the Sugar-cane flower, and on the development of the embryo *in situ*. I have reason now to regret that I was not able at the time to produce the specimens in support of my case. The little which is now left of them, and for which I have to thank M. C. Baschet, I will place before you. You see in this little box and the accompanying sketches the remains of a panicle:—

"1. A scrap of peduncle with a pair of barren spikelets at each of its nodes, one spikelet sessile, the other stalked, with glumes and pales spreading at their base. 2. An internode producing at its lower end a pair of spikelets; the sessile one, four times the ordinary size, is an early development of fertilisation, and has both glumes and pales spreading at its base. 3. A fertile spikelet, five times ordinary size, stalked, and with spreading glumes and pales. 4. A pair of transformed spikelets; a little plant replaces axis for axis the sessile spikelet, and the peduncle bears a remnant of the fertilised flower; the latter is not then completely free.

"The Secretary of the Société Royale des Arts et des Sciences, who arrived in Mauritius a month after the occurrence, says he has seen a specimen of the panicles, and only observed the following:— 1. Simple shoots, situated in the axillary portions of the inflorescence. 2. That the extremities of the peduncles of the flowers which have fallen, according to him, as usual, have no shoots. 3. That if the grain had existed, it would occupy the same place as the flower, *viz.*, the end of the peduncle. 4. That each shoot separately examined does not have the scales which envelope the flower, and which persist in all grasses as an envelope of the grain. 5. That these shoots bear no trace of a grain or a seed-leaf.

"What we have already shown you would be a sufficient answer. However, we will go further:—

"1. The axillary portions of the inflorescence means, as you know, the axils of all the divisions of the panicle. I suppose the shoots are not found in all the angles at once, and that the Secretary means only the axil between each pair of spikelets and the last axis of the panicle. Now, those who have seen the little plants have seen them, as in the specimen before you, in the place of the spikelets axis for axis, and not in any axillary portion of the inflorescence at all. M. C. Baschet and Dr. Le Bobinec have seen it to be so.

"2. The extremities of the peduncles are not free from flowers, and the flowers have not all fallen, for here is a peduncle with an enormously developed flower which the Secretary calls a shoot.

"3. This development of the flower indicates, then, the position of the grain at the extremity of the peduncle.

"4. The scales enveloping the flower, which we interpret as glumes, do exist here. We are not confounding them with the paleoles of the fruit. We say fruit, and not grain, because the envelopes of the one are not exactly those of the other.

"5. The development of the grain causes the destruction of the rest of the fruit, and that is why, at a certain stage, no trace of the fruit can be found on the Sugar-cane; it is the same with the seed-leaf, which we understand to be the cotyledon, unless the Secretary means the cotyledonary sheath, for it is the first dull-coloured amplexicaul leaf which is present at the base of the plant in our specimen."

In the plate which accompanies the paper, a spikelet is figured with the young plant growing out from between the glumes. The figure is from a dried specimen, and nothing is indicated in the young plant except the two primary leaves rolled up.

NEW GUATEMALAN *BROMELIACEÆ.*

By J. G. Baker, F.R.S.

For the opportunity of examining a small set of *Bromeliaceæ*, gathered by himself in Guatemala, I am indebted to John Donnell-Smith, Esq., of Baltimore, who has recently reported on, in the American 'Botanical Gazette,' and distributed a fine collection of plants made by Von Turckheim in the same country.

Æchmea (Hohenbergia) **isabellina**, n. sp. — Leaves lorate, 2 ft. or more long, 2-2½ in. broad, moderately firm, glabrous above, thinly lepidote beneath; apex deltoid-cuspidate; marginal spines large and pungent, lower ⅙ in. long. Peduncle stout, 1½ ft. long, with few large ascending scariose lanceolate bract-leaves. Inflorescence a narrow panicle 2 ft. long, with numerous short simple deflexed branches 1–2 in. long; lower branches much longer and bipinnate, subtended by large red lanceolate bract-leaves; rachis densely pubescent; flowers laxly disposed; flower-bracts ovate-acuminate, ¼ in. long. Sepals ovate, imbricated, ⅙ in. long, not distinctly cuspidate, rather longer than the globose ovary. Petals protruded, ⅛ in., probably yellow.—Boca del Polochic, dept. Ysabel, alt. 200 ft., *Donnell-Smith* 1824! Intermediate between *Æ. laxiflora* Benth. and *pyramidalis* Benth.

Æ. (Lamprococcus) **Donnell-Smithii**, n. sp.—Leaves lanceolate, very rigid, above 2 ft. long, 3 in. broad low down, glabrous above, obscurely lepidote beneath, narrowed gradually to the point; marginal teeth minute, crowded. Peduncle stout, above a foot long, with several pale scariose ascending lanceolate bract-leaves. Inflorescence a dense narrow bipinnate panicle above 2 ft. long, with a stout finely pubescent rachis; many upper branches simple, not exceeding 1–1½ in.; a few of the lowest compound; flowers laxly disposed; flower-bracts minute, lanceolate, not rigid. Sepals ovate, connivent, coriaceous, distinctly cuspidate, ⅙ in. long, connate above the very small naked trigonous ovary. Petals minute. —Rio Dolce, dept. Livingstone, little above sea-level, *Donnell-Smith* 1825! A very distinct species, that comes in between *mexicana* and *Skinneri*.

Æ. (Platyæchmea) **squarrosa**, n. sp.—Leaves thin, ensiform from a very large oblong base, altogether 2½–3 ft. long, 1½ in.

broad at the middle, tapering gradually to the point, glabrous above, obscurely lepidote beneath; marginal spines middle-sized, brown-pointed, the lower 1–12th in. long. Peduncle slender, erect, under a foot long, with a few erect lanceolate bract-leaves. Inflorescence a bipinnate panicle 6–9 in. long, with about 8 erecto-patent branches 3–4 in. long, the lower subtended by small red scariose lanceolate toothed branch-bracts; flowers distichous, laxly disposed, all but the uppermost deflexed; rachis acutely angled; flower-bracts oblong-navicular, coriaceous, ⅓ in. long. Calyx ⅓ in. long; sepals lanceolate, connivent, distinctly cuspidate, as long as the globose ovary. Petals not seen. — Boca de Polochic, dept. Ysabel, alt. 200 ft., *Donnell-Smith* 1823! Allied to *Æ. tillandsioides* and *pubescens.*

Tillandsia vestita C. & S.—Pacayo, dept. Amatillo, alt. 6000 ft., *Donnell-Smith* 1958!

T. bulbosa, Hook.—Escuintla, alt. 1100 ft., *Donnell-Smith* 2010!

T. setacea, Sw.—Pacayo, dept. Amatillo, alt. 6000 ft., *Donnell-Smith* 1959!

T. streptophylla Schiedw.—Rio Dolce, dept. Ysabel, sea-level, *Donnell-Smith* 1660!

Tillandsia (Allardtia) **sparsiflora**, n. sp.—Leaves about a dozen in a rosette, lorate from an ovate base, altogether ½ ft. long, ½ in. broad at the middle, flexible, hardly at all lepidote, much tinged with purple. Peduncle curved, slender, as long as the leaves. Inflorescence a narrow lax panicle 6–8 in. long; branch-bracts lanceolate, bright red, the lower longer than the spikes; spikes laxly disposed, distichous, erecto-patent, 1–1½ in. long, consisting of few much imbricated flowers; flower-bracts linear-oblong, glabrous, ¾ in. long. Calyx shorter than the bract; sepals lanceolate. Petals not seen. — Serraguite, dept. Alta Verapaz, alt. 2500 ft., *Donnell-Smith* 1659!

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.

By James Britten, F.L.S., and G. S. Boulger, F.L.S.

(Continued from p. 281.)

Sheldrake, Timothy (fl. 1740–1759). M.D. 'Herbal of Medicinal Plants,' 1756. 'Botanicum Medicinale,' 1759 (plates also by him). Pritz. 296; Jacks. 499.

Shepherd, John (1764?–1836): b. Gosford, Cumberland, 1764?; d. Liverpool, 27 Sept., 1836; bur. St. Mary's, Edgehill, Liverpool. A.L.S. British botanist. "A scientific horticulturist," Nuttall. For 35 years at Liverpool Bot. Gard. 'Cat.,' 1808. Herbarium, collected 1801–1814, at the Liverpool Garden. Discovered *Erythræa latifolia*, 1803. E. B. 1532-6. 2719. Gard. Mag. xii. 724. *Shepherdia* Nutt.

Sheppard, John (fl. 1848). Of Bristol. 'On Trees,' 1848. Jacks. 207.

Sherard, James (1666–1737): b. Bushby, Leicestersh., 1666; d. 12 Feb., 1737; bur. Evington, near Leicester. Apothecary. M.D. Oxon., 1731. F.R.C.P., 1732. F.R.S. Younger brother of the following. Employed Dillenius to write 'Hortus Elthamensis,' 1732. Had a garden at Eltham. Pult. ii. 150; R. Syn. iii. pref.; Semple, 44; Munk. ii. 127. Loudon, 'Arboretum,' 81. Nich. Anecd. iii. 651. Nich. Illustr. i. 403. Druce, Fl. Oxf. 383, 385.

Sherard, William, *né* **Sherwood** (1659–1728); b. Bushby, Leicestersh., 1659; d. London, 12 Aug., 1728; bur. at Eltham, Kent. B.C.L. Oxon., 1683. D.C.L., 1694. F.R.S., 1718. Pupil of Tournefort. 'Schola Botanica,' under pseudonym SAMUEL WHARTON, 1689. Visited Cornwall and Jersey, R. Syn. ed. 1, 1690, Appendix. Edited Herman's 'Paradisus Batavus,' 1698. Consul at Smyrna, 1703–15. Brought Dillenius to England. Founded Chair of Bot. at Oxford, and bequeathed library, herbarium of 12,000 species, and MS. 'Pinax' to University. Plants in Hb. Sloane. Pult. ii. 141; Rees; Jacks. 606; Rich. Corr. 293; Gorham, 11; Journ. Bot. 1874, 129; Semple, 48; Gent. Mag. lxvi.; Nich. Illustr. i. 339, &c.; Druce, Fl. Oxf. 380. *Sherardia* L.

Short, Thomas (d. 1772): b. Edinburgh; d. Rotherham, 28 Nov., 1772; bur. Sheffield Church. M.D. Of Sheffield, and, from 1762, of Rotheram. 'Explanation of technical words in Bot.,' 1731. 'Medicina Britannica,' 1746. Pritz. 296; Jacks. 245; Nich. Anecd. i. 451; Gent. Mag. lxxvii, lxxviii; Allibone.

Shuter, James (d. before 1834). M.D. F.L.S., 1819. Collected about Madras. Wight Prodr. 208. *Shuteria* Wight. *Shutereia* Chois.

Shuttleworth, Robert James (1810–1874): b. Dawlish, Devon, Feb. 1810; d. Hyères, 19th April, 1874. Captain, 1st Regiment, Duke of Lancaster's Own, 1833. F.L.S., 1856. Orig. memb. B.S.Ed. Conchologist and critical botanist. Resided many years at Berne. 'Excursion in the Valais,' Mag. Zool. Bot. 1838. Had large herbarium, now in Herb. Brit. Mus. (see Journ. Bot. 1878, 179). Jacks. 158; R. S. C. v. 681; Trans. Bot. Soc. Ed. xii. 203; Bull. Soc. Bot. France, xxx. cxxxi.; Whittle, Hist. Preston, ii. 235; Journ. de Conch. xxiii. 92. *Shuttleworthia* Meisn. = *Verbena*.

Sibbald, Sir Robert (1641–c. 1712): b. near Leslie, Fife, 15th April, 1641; d. c. 1712. M.D., Leyden, 1661. F.R.C.P., 1686. First Prof. Medicine, Univ. Edinb. 1685. Knighted, 1682. 'Cat. of Pl. in King's Park, Edinb.,' 1684, 'Scotia Illustrata,' 1684. Pult. ii. 3; Pritz. 296; Jacks. 246; Munk, i. 439; Autobiog., 1833, and in 'Analecta Scotica,' i. 126. *Sibbaldia* L.

Sibthorp, John (1758–1796): b. Oxford, 1758; d. Bath, 8th Feb. 1796; bur. Bath Abbey. M.A., Oxon, 1780. M.D., 1784. Prof. Bot., Oxford, 1783–1795. F.L.S., 1788. F.R.S. Travelled in Greece with Ferdinand Bauer, 1786–87, and in Cyprus, Asia Minor, &c., 1794–95. 'Flora Oxoniensis,' 1794. 'Flora

Græca' (posth.), 1806–40. Rees; Pritz. 296; Jacks. 606; Pref. to 'Fl. Græca'; Druce, Fl. Oxfordsh., 387. Oil portr. at Oxford Garden.

Sidebotham, Joseph (1824–1885): b. Apethorne, Hyde, Cheshire, 1824; d. Bowdon, Cheshire, 30th May, 1885; bur. Bowdon. Calico-printer, of Manchester. Entomologist, astronomer, and photographer. F.L.S., 1878. Contrib. to Phyt., 1841. 'Pl. in Westmoreland.' One of founders of Manchester Field Nat. Soc. Journ. Bot. 1885, 319; Proc. Linn. Soc. 1883–86, 107; R. S. C. v. 683; viii. 948.

Sidney, Rev. Edwin (fl. 1800–1846). B.A., Camb., 1821. M.A., 1825. Rector of Cornard Parva, Suffolk. 'Philosophy of Nutrition in Plants,' 1849. 'Blights of Wheat,' 1846. Jacks. 167; R. S. C. v. 684; Allibone.

Silliard, Zancke (fl. 1640). Apothecary, Dublin. Sent *Drosera anglica* to Parkinson, 'Theatr.,' 1053.

Sim, Robert (c. 1828–1882): b. Kent, 1828?; d. Foot's Cray, Kent, Sept. 1882. Nurseryman. Knew Brit. Ferns well. 'Catalogue British Ferns and Varieties,' 1863. Gard. Chron. 1882, ii. 472.

Simmonds, Thomas Williams (d. 1804): b. Dartford? Kent; d. Trinidad, 1804. Of Settle. Surgeon. Naturalist to Lord Seaforth, Governor of Barbadoes, 1803. Windsor's 'Flora Cravoniensis,' dedication & viii. R. S. C. v. 700. *Simmondsia* Nutt.

Simmonite, William Joseph (fl. 1840–1854). Of Sheffield. 'Medical Botany,' 1848. Jacks. 202; R. S. C. v. 700; Allibone.

Sims, John (1749–1831): b. Canterbury, 1749; d. Dorking, 1831. M.D., Edinb., 1774. F.L.S., 1788. Studied at Leyden, 1773–74. Settled in London, 1779. Edited 'Annals of Bot.' with König, 1805–6, and 'Bot. Mag.,' vols. xiv.–xlii. Plants in Herb. Kew. Jacks. 606; R. S. C. v. 707; Gard. Chron. 1887, i. 641. Private etched portr. by Mrs. Dawson Turner. Engr. (medallion) portr., 1817, in Ann. Bot. i. *Simsia* Br.

Sinclair, Andrew (d. 1861): drowned in R. Raugitata, New Zealand, 26th March, 1861. M.D. F.L.S., 1857. Assistant Surgeon, R.N., 1824, on H.M.S. 'Sulphur.' Colonial Sec., New Zealand. Collected in Australia and New Zealand. Plants at Kew. 'Vegetation of Auckland.' R. S. C. v. 707; Journ. Bot. 1851, 212; Gard. Chron. 1861, 773; Proc. Linn. Soc. 1861–2, xcv. *Sinclairia* Hook. = *Liabum*.

Sinclair, George (1786–1834): b. Mellerstain, Berwicksh., 1786; d. Deptford, 13th March, 1834. Gardener to Duke of Bedford. Seedsman. F.L.S., 1824. 'Hortus Cantabrigiensis,' ed. 12, 1831. 'Hortus Gramineus Woburnensis,' 1816, ed. 2, 1824; ed. 3, 1835; ed. 4, 1838. Pritz. 298; Jacks. 606; Gard. Mag. x. 192; Donaldson's Agric. Biog. 113.

Sinclair, Sir John, Bart. (1754–1835): b. Thurso Castle, Caithness, 10th May, 1754; d. Edinburgh, 21st Dec. 1835. Statist. President, Board of Agriculture, 1793. F.R.S. F.L.S., 1810. M.P., Caithness, &c., 1780–1811. D.C.L., Glasgow, 1788.

Bart., 1786. 'Hints on Vegetation,' 1796. 'Inquiry into . . . Blight,' 1809. Jacks. 67; Memoir by Rev. John Sinclair, 1837; Gent. Mag. 1836, i. 431; Donaldson, Agric. Biog.

Skeen, James (fl. 1703). Surgeon. Sent plants from Guinea to Petiver, Mus. Pet. 95.

Skene, David (1735?–1771): b. Aberdeen, 1735?; d. Aberdeen, Dec. 1771. M.D., Aberdeen. Had a herbarium. Corresponded with Linnæus. Murray, 'Northern Flora,' ix.

Skepper, Edmund (1825–1867): b. Oulton, Suffolk, 20th Oct. 1825; d. Bury St. Edmunds, 2nd June, 1867; bur. Bury Cemetery. Druggist at Harwich and Bury. 'Flora of Suffolk,' 1860. Jacks. 260; Hind's 'Fl. Suffolk,' 485.

Skinner, —. (fl. 1772). "Acutissimus oculatissimusque Botanicus Oxoniensi," Forst. Gen. p. 58. *Skinnera* Forst.

Skinner, George Ure (1804–1867): b. Newcastle, 18th March, 1804; d. Aspinwall, Panama, 9th Jan. 1867. F.L.S., 1866. Merchant in Leeds and Guatemala. Collected and grew Orchids. Trans. B. S. Ed. ix. 91; Gard. Chron. 1867, 180; Proc. Linn. Soc. 1866–7, xxxviii. *Uroskinnera* Lindl.

Skrimshire, William (1766–1830). Entomologist. Of Wisbech. Contrib. to Eng. Bot. (379, 423, 463, 1369). R. S. C. v. 712.

Sleeman, Sir William Henry (1788–1856): b. Stratton, Cornwall, 1788; d. at sea on passage from Calcutta, 10th Feb. 1856. H. E. I. C. military service, 1808. Major-general, 1855. K.C.B., 1856. 'Age and Flowering of Bamboos,' Trans. Agric. Soc. India, 1839–1842. R. S. C. v. 714; Gent. Mag. 1856, ii. 243; Allibone.

Sloane, Sir Hans (1660–1753): b. Killileagh, Co. Down, 16th April, 1660; d. Chelsea, 11th Jan. 1753; bur. Chelsea Churchyard. M.D., Orange, 1684; Oxon, 1701. F.R.S., 1685. P.R.S., 1727–1740. F.R.C.P., 1687. P.R.C.P., 1719–1735. Baronet, 1715. For. Memb. Acad. Sci., 1708. Pupil of Tournefort. 'Catalogus Pl. Jamaic.,' 1696. 'Nat. Hist. of Jamaica,' 1707–1725. Gave Chelsea Garden to Apothecaries' Company. Herbarium, 240 vols., library, and MSS. in Mus. Brit. Pult. ii. 65; Rees; Pritz. 298; Jacks. 607: Ray Mem. 40; Nich. Illustr. i. 269; Munk, i. 460; Literary Mag. 1790, with portr. by Angus; Faulkner's Chelsea, i. 338, with portr. engr. T. Prescott; Semple, with portr., 26. Statue by Rysbrach in Chelsea Garden. Wedgwood medallion. Portr. at R.C.P. by T. Murray, engr. Faber, 1728. Portr. by Kneller, 1716, engr. Faber, 1729. *Sloanea* L.

Smart, John (fl. 1708). Surgeon. Sent Hudson's Bay and Maryland plants to Petiver, Hb. Sloane 159; list in his handwriting in Hb. Sloane, 158.

Smeathman, Henry M. (1750–1787). Collected in Sierra Leone, Madagascar, and W. Indies. Plants in Brit. Mus. and Herb. DeCandolle. *Smeathmannia* Br.

Smee, Alfred (1818–1877): b. Camberwell, London, 18th June, 1818; d. Wallington, Croydon, 11th Jan. 1877; bur. Beddington. M.R.C.S., 1840. F.R.S. F.L.S., 1875. Surgeon to

Bank of England. 'The Potato-plant,' 1846. 'My Garden,' 1872. Pritz. 299; Jacks. 412; R. S. C. v. 715; Memoir by his daughter; Gard. Chron. 1877, i. 88, 108, with portr.

Smith, Mrs. (*née* Macdonald), (fl. 1839). Studied and collected Orchids in Van Diemen's Land. Lindley, Swan River, p. i. *Macdonaldia* Gunn. (Lindl.) = *Thelymitra.*

Smith, Alexander (1832–1865): b. Kew, 17th Dec. 1832; d. Kew, 15th May, 1865; bur. Kew Churchyard. Son of John Smith (*vide infra*). Curator of Kew Museum, 1856–1858; of Herbarium, 1864. Curator, Natal Garden, 1853. Contributed to 'Treas. Bot.' R. S. C. v. 716; Journ. Bot. 1865, 199. Photo. portr. Kew.

Smith, Charles (fl. 1744–1774). M.D. Of Dublin. Irish county historian. Lists of plants in his County Histories. Pult. ii. 202; Cybele Hibern. 384. Portr. in 'State of Kerry,' 1756.

Smith, Charles H. J. (fl. 1852). Landscape Gardener. Of Edinburgh. 'Parks and Pleasure Grounds,' 1852.

Smith, Christopher (d. 1806?): d. Penang, 1806? F.L.S., 1793. Sent to Otaheite in H.M.S. 'Providence,' 1791. Botanist to H. E. I. C., 1794. Sent to Moluccas, 1796. Superintendent, Bot. Gardens, Moluccas, circ. 1805. Drawings and plants in Bot. Dept., Brit. Mus. Ann. Bot. i. 569 (1805); Gard. Chron. 1881, ii. 267.

Smith, Edwin Dalton (fl. 1823–32). Of Chelsea. Botanical draughtsman. F.L.S., 1823. Drew plants for Sweet's 'Flower Garden,' 1823–32. Sweet, Fl. Gard. 1, ii. 142. Illustrated in McIntosh's 'Flora and Pomona,' 1829. Jacks. 214.

Smith, Mrs. Elizabeth (fl. 1797). Of Barnham House, Gloucestersh. Discovered *Cephalanthera rubra.* Eng. Bot. 437.

Smith, Frederick Porter (1833–1888): b. 1833; d. Shepton Mallett, March, 1888. M.B., Lond., 1855. Medical Missionary in Central China. Contrib. to Materia Medica and Nat. Hist. of China, 1871. Pharm. Journ. 3 S. xviii. 859; R. S. C. viii. 968.

Smith, Frederick W. (fl. 1834–38). Illustrated Paxton's 'Mag. Bot.,' 1834–38; 'Florists' Magazine,' 1836. Pritz. 299; Gard. Chron. 1887, ii. 434.

Smith, G. Campbell (fl. 1831–6). Land Surveyor. Of Banff. Discovered *Pinguicula alpina* in Ross. Murray, 'Northern Flora,' 17.

Smith, Rev. Gerard Edwards (1805–1881): b. 1805; d. Ockbrock, Derby, 21st Dec. 1881. Vicar of Cantley, Yorks., 1844–6; of Osmaston, Derby, 1854–71. 'Cat. of Pl. of South Kent,' 1829. Described *Ophrys arachnites* and *Statice binervosa* for Eng. Bot. Suppl. (2596 & 2683), and *Filago apiculata* in Phyt. 1846. Herbarium at University Coll., Nottingham. Pritz. 299; Jacks. 254; R. S. C. v. 723; Journ. Bot. 1882, 63; Top. Bot. ed. 2, 556.

Smith, Henry (fl. 1816). M.D. F.L.S., 1816. Physician to Salisbury Infirmary. 'Flora Sarisburiensis,' 1817. Pritz. 299.

Smith, Henry Ecroyd (1823–1888): b. Doncaster, 28th Aug. 1823; d. Middleham, Yorksh. 1888. Archæologist. Went to

Victoria, 1852. Contributed to 'Flora of Liverpool,' 1872. R. S. C. v. 724.

Smith, James (fl. 1820). Nurseryman, of Ayr. "A very diligent practical botanist," Mem. Wernerian Soc. iii. 298. Discovered *Veronica hirsuta*. Hook. Fl. Scot. 6.

Smith, James (fl. 1830). Of Edinburgh. In Demerara, 1829. 'On the Milk-tree of Demerara,' Edinb. New Phil. Journ. viii. 1830, 315. R. S. C. v. 725.

Smith, Sir James Edward (1759–1828): b. Norwich, 2nd Dec. 1759; d. Norwich, 17th March, 1828; bur. Lowestoft. M.D., Leyden, 1786. F.R.S., 1785. Founded Linn. Soc., 1788. P.L.S., 1788–1828. Purchased Linnæus' collections, 1784. Knighted, 1814. 'English Bot.,' 1790–1814. 'Flora Brit.,' 1794–1804. *μέγα κῦδος βριταννῶν* Sprengel; Pritz. 299; Jacks. 607; 'Memoir and Correspondence,' by Lady Smith, with portr. by H. B. Love, engr. W. Say, after bust by Chantrey; R. S. C. v. 725; Nich. Illustr. vi. 830, with portr.; Nich. Anecd. viii.; Cott. Gard. v. 185; Mag. Nat. Hist. i. (1829), 90; Gent. Mag. 1828, i. 297; Allibone. Bust by Chantrey at Linn. Soc. Portr. in Thornton. Copy at Kew. Engr. by R. Pastorini. *Smithia* Aiton, Dryander.

Smith, Rev. John (fl. 1695). Sent plants to Petiver from Guinea, Mus. Pet. nos. 21, 95.

Smith, John (1798–1888): b. Aberdour, Fife, 5th Oct. 1798; d. Kew, 14th Feb. 1888; bur. Kew Churchyard. A.L.S., 1837. Gardener at Edinburgh Bot. Gard., 1818; at Kew, 1822; Curator, 1841–64. 'Ferns, British and Foreign,' 1866. 'Domestic Botany,' 1871. 'Historia Filicum,' 1875. 'Dictionary of Economic Botany,' 1882. Pritz. 300; Jacks. 607; R. S. C. v. 729; viii. 972; Journ. Bot. 1888, 102; Autobiog., Gard. Chron. 1876; Gard. Chron. 1888, i. 216; Athenæum,' 1888, i. 248; Annals of Bot. ii. (1889), 429, with bibliog. Photo. portr. at Kew. Fern Herbarium in Mus. Brit.

Smith, Joseph (1774?–1857): d. Gray's Inn, London, 26th May, 1857. Barrister. F.R.S., 1819. F.L.S., 1811. "Well acquainted with British plants," Proc. Linn. Soc. 1857–8, xxxvii.

Smith, Rev. William (1808–1857): b. Ballymoney, Co. Antrim, 12th Jan. 1808; d. Cork, 6th Oct. 1857. Unitarian Minister. F.L.S., 1847. Prof. Nat. Hist., Queen's Coll., Cork, 1854. 'Synopsis of Brit. Diatoms,' 1853–56. 'List of Diatomaceæ in Brit. Mus.,' 1859. Pritz. 300; Jacks. 607; R. S. C. v. 733; Proc. Linn. Soc. 1857–58, xxxvii.

Smith, William (1804?–1828); b. Hopetoun, Linlithgowsh., c. 1804; d. London, 15th Nov. 1828. A.L.S., 1828. Gardener R. Hort Soc., Chiswick. Studied British roses. Gard. Mag. v. 495.

Snooke, William Drew (1787–1857): b. Wool, Dorset, 6th Nov. 1787; d. Ryde, 5th Sept. 1857; bur. Ryde Cemetery. 'Flora Vectiana,' 1823. Jacks. 254.

Solander, Daniel Charles (1736–1782): b. Nordland, Sweden, 1736; d. London, 1782. D.C.L., Oxon, 1771. F.R.S. Favourite pupil of Linnæus. Came to England, 1760, as Under-librarian, Brit. Mus. Accompanied Banks on Cook's first voyage, 1768–1771, and to Iceland, 1772. Librarian to Banks. Edited Ellis's 'Hist. Zoophytes,' 1786. MSS. in Bot. Dept., Mus. Brit. Pult. ii. 350; Chalmers; Linn. Letters, ii. 1; Woolls, Bot. Discov. Austral. 8. Oil portr. and medallion at Linn. Soc. Two Wedgwood medallions. Engr. by J. Newton, 1784, after J. Sowerby. Litho. from oil portr. at Linn. Soc.; at Kew. *Solandra* L. = *Hydrocotyle*. *Solandra* L. fil.

Sole, William (1739 ?–1802): b. 1739 ?; d. Bath, 7th Feb. 1802. Of Bath. Druggist. A.L.S., 1788. 'Menthæ Britannicæ,' 1798. MS. 'Flora Bathonica,' 1782. Pritz. 300; Jacks. 238; Gent. Mag. 1802, i. 274; Phyt. iii. 581. *Solea* Spr.

Solly, Edward (1820 ?–1886): b. 1820 ?; d. Sutton, Surrey, 2nd April, 1886. F.L.S., 1842. F.R.S., 1843. Prof. Chemistry, Royal Hort. Soc. Brother-in-law of Royle. 'Veg. Physiology based upon Electricity,' 1847. Jacks. 607; R. S. C. v. 745–6; 'Athenæum,' 1886, i. 489.

Solly, Richard Horsman (1778–1858): b. London, 29th April, 1778; d. London, 31st March, 1858. F.R.S. F.L.S., 1826. Studied Vegetable Physiology and Anatomy. Bot. Reg. t. 1466; R. S. C. v. 746. *Sollya* Lindl.

Somerset, Mary (*née* Capel), **Duchess of Beaufort** (1630 ?–1714): b. 1630 ?; d. Badminton, Gloucestersh., 7th Jan. 1714; bur. Badminton. Previously Lady Beauchamp. Had a botanic garden at Badminton, Rich. Corr. 33; Loudon, 'Arboretum,' 61; Plants in Herb. Sloane. *Beaufortia* R. Br.

Sommerville, Thomas (1783 ?–1810): d. Edinburgh, 17th March, 1810. Superintendent, Bot. Gard., Edinburgh. Mem. Wern. Soc. i. 246.

Southby, Anthony (*olim* Gapper), (fl. 1835–1842). Of Bridgewater. M.D. Sent catalogue of Somerset and Wilts plants to Watson, N. B. G. 27. Top. Bot. ed. 2, 556; R. S. C. v. 762.

Sowerby, Charles Edward (1795–1842): b. London, 1795; d. London, 7th May, 1842. A.L.S., 1827. Third son of James Sowerby. Superintended small edition of Eng. Bot. Contrib. to Eng. Bot. 2446. Pritz. 301; Jacks. 235; Proc. Linn. Soc. i. 149.

Sowerby, George Brettingham (1788–1854): b. Lambeth, 1788; d. 26th July, 1854. F.L.S., 1811. Second son of James Sowerby. Conchologist and muscologist. Contrib. to Eng. Bot. (1304, 1710, 1866, 1939). Gent. Mag. 1854, ii. 406; 'Athenæum,' 1854, 971; Allibone.

Sowerby, James (1757–1822): b. London, 21st March, 1757; d. Lambeth, 25th Oct. 1822. Botanical Artist. A.L.S., 1788. F.L.S., 1793. 'Botanical Drawing-book,' 1789. 'English Botany,' with Smith, 1790–1814. 'Brit. Fungi,' 1797–1809. 'Exotic Botany,' 1804–5. Eng. Bot. 103, 317; Pritz. 301; Jacks. 608; R. S. C. v. 765; Gent. Mag. 1822, ii. 568; Cott. Gard. v. 29. Engr. portr. at Linn. Soc. *Sowerbæa* Sm.

Sowerby, James De Carle (1787?–1871): b. Stoke Newington, 1787?; d. London, 26th Aug. 1871. F.L.S., 1823. Eldest son of the preceding. Chemist and conchologist. Sec. Royal Bot. Soc., 1839–69. Drew figures in Loudon Encycl. of Plants and Supplement to Eng. Bot. (originals in Bot. Dept., Brit. Mus.). Described some plants in Eng. Bot. Suppl. R. S. C. v. 765; viii. 987; Proc. Linn. Soc. 1871–2, lxxix.; Gard. Chron. 1871, 1260; Journ. Bot. 1871, 319.

Sowerby, John Edward (d. 1870). Son of Charles Edwards. Botanical draughtsman. 'British Wild Flowers Illustrated,' 1860. Jacks. 608.

Speede, G. T. Frederic S. Barlow (fl. 1840–1848). 'Indian Handbook of Gardening,' 1840; ed, 2, 1842 (list of plants in Hindustani and English). Jacks. 11.

Spicer, Rev. William Webb (1820?–1879): b. Westminster, 1820?; d. 28th April, 1879. B.A., Oxon, 1843. M.A., 1848. Rector, Itchen Abbas, 1850–74. Contrib. to Phyt. iv. 'Handy book to collection of Freshwater Algæ,' 1867. 'Handbook of Plants of Tasmania,' 1873. Jacks. 608; R. S. C. viii. 989.

Spittall, Robert (fl. 1829–1846). Surgeon. Of Edinburgh. President, Plinian Nat. Hist. Soc., 1829. Experimented on *Mimosa pudica*, Edinb. New Phil. Journ. 1830, 60. R. S. C. v. 775.

Spottswood, —. (fl. 1673). Surgeon. Published catalogue of Tangier plants in 1673. Plants in Hb. Delessert. Lasègue, 440, 504.

Spratt, George (fl. 1829–1843). M.R.C.S. Editor of 'Flora Medica' (published anonymously), 1829–30. 'Medico-botanical Pocket-book,' 1836. Supplied medico-botanical portion and superintended colouring plates of Woodville's 'Medical Botany,' ed. 3, 1832. Pritz. 303.

Stackhouse, John (1742–1819): b. Trehane, Cornwall, 1742; d. Bath, 22nd Nov. 1819. Fellow, Exeter College, Oxford, 1761–64. F.L.S., 1795. 'Nereis Britannica,' 1795–1801; ed. 2, 1816. Translated Theophrastus' Hist. Pl., 1811. Pritz. 304; Jacks. 608; R. S. C. v. 787; Gent. Mag. 1820, i. 88. Portr. in his Theophrastus. *Stackhousia* Sm.

Stanger, Hon. William (1813?–1854): b. Wisbech, Cambridgesh., 1813?; d. D'Urban, Natal, 14th March, 1854. F.B.S.Ed., 1836. M.D., Edinb. Visited Australia. Practised in London. On the Niger Expedition, 1841. Surveyor-General, Natal. Discovered *Stangeria*. Journ. Bot. 1853, 228; 'Athenæum,' 1854, 749. *Stangeria* Moore.

Stanhope, Philip Henry, 4th Earl (1781–1855): b. London, 7th Dec. 1781; d. Chevening Park, Sevenoaks, Kent, 2nd March, 1855. M.P., 1806. Succeeded, 1816. Pres. Med.-Bot. Soc. Lond., 1829–1836. Gent. Mag. 1855, ii. 89. *Stanhopea* Hook.

Stansfield, Abraham (1802–1880): b. Hugeon Croft, Kebcote-in-Stansfield, 12th Jan. 1802; d, Todmorden, Cheshire, 15th Aug. 1880. Nurseryman, of Vale Gardens, Todmorden. First Pres., Todmorden Bot. Soc., 1852. Collected vars. of Brit. ferns.

'Flora of Todmorden,' ? MS. Catalogues of Ferns. Jacks. 152. Gard. Chron. 1880, ii. 283.

Stark, Robert Mackenzie (1815–1873): b. Dirleton, East Lothian, 1815; d. London, 29th Sept. 1873. Nurseryman in Edinburgh. F.B.S. Ed., 1841. 'Muscology of Cirencester,' Bot. Soc. Lond., March, 1839, Ann. & Mag. iv. (1840), 211. 'Popular Hist. Brit. Mosses,' 1853. Pritz. 304; Jacks. 609; Trans. Bot. Soc. Ed. xii. 29.

Staunton, Sir George Leonard, Bart. (1737–1801): b. Cargin, Galway, 1737; d. London, 14th Jan. 1801; bur. in Westminster Abbey. F.L.S., 1789. F.R.S. M.D. D.C.L., Oxon, 1790. Practised in West Indies, 1762–1781. Accompanied Macartney to Madras, 1781, and to China, 1792. Bart., 1785. Collected in China. Plants in Herb. Mus. Brit. Gent. Mag. 1801, i. 89, 183; DC. Syst. i. 513. Monument by Chantrey in Westminster Abbey. *Stauntonia* DC.

Steele, William Edward (1817?–1883): b. 1817?; d. Dublin, 6th May, 1883. A.B., Dublin, 1857. M.D., Dublin, 1856. Director, Science and Art Mus., Dublin. 'Handbook of Field Bot., 1847; ed. 2, 1851. Pritz. 304; Jacks. 609; R. S. C. v. 803; Journ. Bot. 1883, 192.

Steggall, John (fl. 1829–1860). M.R.C.S., 1825. M.D., Bologna and Pisa. 'Introduction to Botany,' 1829. 'Elements of Bot.,' ed. 2, 1831. Pritz. 305; Jacks. 38.

Steggall, Rev. William (fl. 1826–1854). B.A., Camb., 1826. M.A., 1829. Vicar of Hunston, Suff., 1846. Herbarium of 30 vols. (1830–34) in library of Stowlangtoft Hall. Hind's Fl. Suffolk, 489.

Stephens, Henry Oxley (fl. 1840–54). Of Bristol. Contributed to Ann. & Mag., 1840–42, to Phyt., ii. and to Swete's 'Flora Bristoliensis' (see pref. vi.). 'Mycology of Bristol,' Ann. & Mag. iv. (1840), 246. Had a herbarium. R. S. C. v. 822. *Stephensia* Tul.

Stephens, Philip (d. after 1660): b. Devizes, Wilts.; d. London, after 1660. M.D., Oxon, 1655. F.R.C.P., 1659. 'Catalogus Hort. Bot. Oxoniensis,' with William Browne and the Bobarts, 1658. Pult. i. 166; Pritz. 305; Jacks. 415; Munk, i. 296; Wood, Fasti, ii. ed. 189.

Stephens, William (fl. 1718–1732). M.D., Leyden, 1718; Dublin, 1724. Lecturer, Trin. Coll., Dublin. 'Botanical Elements,' Dublin, 1727. Allibone.

Stephens, William (d. 1866): murdered near Mooloolah, Queensland, 1866. Kew gardener? Formerly of Richmond, Surrey. Collector for Brisbane Bot. Gard. Gard. Chron. 1866, 520.

Stephenson, John (fl. 1831). M.D., Edinb. F.L.S., 1829. 'Medical Botany,' with J. M. Churchill, 1831. Pritz. 305; Jacks. 201.

Stewart, Archibald (fl. 1699). Surgeon. Sent ferns from Darien to Petiver (Mus. Pet. n. 52; Hb. Sloane, 157).

(To be continued.)

SHORT NOTES.

Crepis nicæensis Balb., in Beds.—This species has occurred in great abundance during the spring and early summer of this year, in various parts of South Beds. It appears to have been introduced with foreign grass seeds, as it has been observed chiefly in pasture lands that have been recently laid down, whence it has been distributed to railway banks and occasionally to waste ground. It was first noticed in May, when walking through a field, its rosette of leaves and immature inflorescence arresting one's attention, as being unlike anything one had observed before. Not being able to make it agree with any species of *Crepis* in Hooker's 'Student's Flora,' specimens were sent to Mr. Baker, named doubtfully as *C. biennis*, but that gentleman expressed the opinion that it was *C. nicæensis* Balb. Subsequently it was noticed in many fields, in the parishes of Leagrave, Toddington, Stopsley, and Totternhoe. Mr. C. Crouch also found it in several places near Pullox Hill.—James Saunders.

Brachypodium pinnatum in Bucks. — Specimens of this plant have been sent me by Mrs. John Tindall, of Leighton, who found them in a field between the Soulbury Road and Linslade, at the back of a farm house on the Liscombe estate. This is not recorded for Bucks in the 2nd ed. of Watson's 'Topographical Botany.'—James Saunders.

Hypnum circinale.—In his note on *Hypnum circinale* (p. 238), Mr. McArdle is puzzled to know why I take it for any form of *H. hamulosum.* He must surely have misunderstood M. Cardot's note, for I quite agreed with that eminent bryologist, that the moss named by Moore *H. hamulosum* did *not* belong to that species, but very probably was *H. circinale*, as M. Cardot supposed. It is quite as probable that it is *Stereodon canariensis* Mitt., with which I had not at the time an opportunity to compare it; but I am very much puzzled to understand how Mr. McArdle can refer *Stereodon canariensis* Mitt., which had no existence as a botanical species before Nov. 5th, 1863 (Journ. Linn. Soc. Bot. viii. 5) to *Leucodon canariensis* (Brid.) Schwaeg., seeing that the Dillenian figure he quotes represents even a larger plant than the adjoining figure 40, our great *Hylocomium loreum.* The geographical distribution of some of the species mentioned is also not particularly remarkable, and *Campylopus introflexus* is widely distributed throughout the whole world, between the Alps in the north and Tasmania in the southern hemisphere.—R. Braithwaite.

Helianthemum guttatum in Anglesea. — With *Helianthemum Breweri* , which was abundant over a limited area near Holyhead, I gathered two or three specimens of *H. guttatum* Mill. The specimens were more luxuriant than *Breweri*, and were quite ebracteate; the leaves were somewhat broader than those on my Jersey plants. Mr. J. G. Baker says he should consider it typical *H. guttatum.*—G. C. Druce.

Trientalis europæa in Foula.—During a brief visit to Foula, one of the most remote of the Shetland Islands, I noticed *Trientalis* *europæa.* This has hitherto been recorded from only one locality in Shetland,—in Unst. As there are no trees on the island, the stems of *Rumex obtusifolius* and *R. crispus* are carefully dried by the natives and woven into small baskets or creels, chiefly used for carrying fish.—R. M. Barrington.

Dianthus cæsius Sm.—An earlier name for this plant is *D. Gratianopolitanus* Villars ('Hist. des Plantes de Dauphiné,' iii. 598 (1789). This is pointed out by Verlot, 'Plantes Vasculaires du Dauphiné,' p. 51 (1872); and Villars' name is also cited for the species by Nyman, although he retains Smith's name, published July 1st, 1792, according to the date on the 'English Botany' plate accompanying his original description.—Frederic N. Williams.

Flora of Somerset. — The Rev. R. P. Murray will publish a new Flora of this county in the 'Proceedings of the Somerset Natural History and Archæological Society,' and hopes to issue the first part in the autumn of next year. He will be glad to receive any help in his work: address—Rev. R. P. Murray, Shapwick Vicarage, Blandford.

NOTICES OF BOOKS.

Through the Fields with Linnæus; a Chapter in Swedish History. By Mrs. Florence Caddy. 2 vols. 8vo, pp. 347, 376. London: Longmans, Green & Co. 1887.

The Floral King: a Life of Linnæus. By Albert Alberg. 8vo, pp. 244. London: W. H. Allen & Co. 1888.

These biographies of Linnæus should have been noticed earlier in these pages. They are both popular works, having each excellencies in their own way, and also defects. Mrs. Caddy, to prepare herself for her work, made a diligent pilgrimage to the districts familiar to Linnæus in the different periods of his life. Possessed of a lively imagination, she has supplied many gaps in the story, has put into the mouths of Linnæus and his friends interesting speeches, and has indeed treated the whole subject as a novel, with Linnæus as the hero. The struggles of his early life, his tragic quarrel with Rosen, his courtship of his future wife, and many other familiar incidents in the life of the illustrious Swede, supply congenial topics for Mrs. Caddy's facile pen. The following extract dealing with a subject strange to our pages may interest our readers, and illustrate Mrs. Caddy's methods:—

"Falun had materially altered in its aspect for Linnæus since he had been absent. Sara Elizabeth, the elder of the two handsome daughters of Dr. Moræus, had come from Sveden, her father's country seat at some distance from Falun, and she, like the rest of the world in the Dalecarlian capital, was curious to see the interesting traveller who had recently returned successful at the head of an adventurous band of explorers. In fancy I can see their introduction to each other; they first shook hands, then she bobbed a curtsey, and he lifted off his hat. This is the order of the usual salutation in Sweden. The little girls and young women always dip a curtsey to every one in the company; even the youngest boys never omit to take off their hats separately to each person. 'I was struck when I first saw her,' writes Linnæus to his friend Haller, 'and felt my heart assailed by new sensations and anxieties. Nature is nature wherever you find it,' whether in the land of Romeo or Linnæus. Elizabeth, too, seems at once to have felt the strange power of eyes made to discover truth; and here was a truth entirely new to him—that the charm of a beautiful maiden is the most exquisite thing in the world. He who had counselled the young men, his companions, to keep their heads free of love—was science all-sufficient for him now?" But we must stop, and refer our readers to the work to read the graphic account of the stormy course of true love in the conduct of the stern father, the hard terms, and so on. Mrs. Caddy has certainly made a most readable book. The incidents of her journeyings and the events of last century are sometimes curiously interwoven, but, as becomes the authoress of such a work, she is devoted to her hero, and she makes him live to her readers.

Mr. Alberg's volume derives its chief value from his being able to incorporate in it and to give for the first time in English dress some of the results of the Linnean studies of the lamented Ahrling. Mr. Alberg's style is somewhat flowery, and he writes English as if it were his mother-tongue. As a specimen of the work, the paragraph narrating the birth of Linnæus may entertain our readers:—"At last spring returned, and what joy did it bring to her yearning heart; for not only is spring in Sweden the most beautiful season of the year, when nature in a few days wakes from wintry sleep from under the snowy cover, and the soil gratefully absorbs the remaining snow to fertilize the earth, whole masses of ice, dissolving into water, hasten away in merry little rills, as if afraid of being hid in the earth, and rush to swell the tributaries of the many rivers, which all make for the cool, clear sea; and when every twig and pond is covered with eager-budding leaflets, kissed to life by spring, and inquisitive to look abroad—at this delightful season, when all nature rejoices at the spring-time of our existence, 'just when the cuckoo with mystic notes heralded the advent of the floral season,' the curate and his young wife, on the 13th of May. the old Gregorian style, anno 1707, were supremely blest by the seasonable advent of a young cherub, for to them was that day born a son and heir, and alighting upon earth, as he did, in the joyous, verdant spring, in such a happy floral home, it seemed as if the pretty little flowers of the curate's garden had enticed him there from the first to become their playmate, and subsequently to become their most ardent lover."

Mr. Alberg is equally fluent in dealing with his own English and Ahrling's Swedish, but when he prints Latin words or quotations, and specially when he tries to translate from the Latin, he is singularly unfortunate, and a Greek word which he tries to reproduce presents a hopeless stumbling-block: no one would recognize Bauhin's ΠΙΝΑΞ in "Bauhinus's K.I.U.A.E." On one opening of the book (pp. 132, 133) we find the following renderings of one word:—*Pelagica, plelaica*, and *Petagicia*. As a specimen of Latin translation we may give the rendering of this sentence from the 'Hortus Cliffortianus':—"Nomen obtinuit ab illustriss. Hans Sloane, Præside Societatis Regiæ Anglicanæ, cui fere soli debetur notitia plantarum jamaicensium et plurium americanarum." Mr. Alberg introduces his rendering thus:—"But when Linnæus in *Hort. Cliff.* records the species Sloane, he remarks, 'This name holds its place amongst the illustrious. To Hans Sloane, President of the Royal British Society, is owing nearly all our knowledge of Japanese also of many American plants.'" We will add a single sentence from the account of the journey to Lapland in Prof. Alberg's "own quaint, peculiar style," which we leave as a puzzle with our readers. Linnæus says:—"I have seen solemn inoccidum in the coldest winter." W. CARRUTHERS.

Timbers, and how to know them. By Dr. ROBERT HARTIG. Translated from the third German edition, by WILLIAM SOMERVILLE, D.Œ., B.Sc., F.R.S.E. Edinburgh: David Douglas. 1890. 8vo. 22 Cuts.

As stated in the first line of the preface of this little book, "The want has often been felt in this country of a work, in handy form and at a low price, which would enable one with ease and certainty to identify timbers, and at the same time give a concise account of their composition, qualities, and structure." With this we heartily agree, and welcome Dr. Hartig's efforts as a small contribution to this end. Whether it will go far in helping seekers of knowledge in this direction is doubtful, as each wood referred to is dismissed with remarkable brevity, only a few lines, indeed, being given in most cases; more details, both as to microscopical structure and to the general appearance of the woods as to colour, shade, and markings, both in longitudinal and cross sections, are needed to make such a book really useful, and, if carefully carried out, would be invaluable to a forester. Such descriptions of the woods, indeed, might well be added to those of the plants in any Forest Flora. Thus, for instance, in Gamble's 'Manual of Indian Timbers,' and Brandis's 'Forest Flora of North-west and Central India,' we have the material for a fairly complete book on Indian timber trees. American woods have been treated in a similar way by Prof. Sargent, but the scattered material of such books requires bringing together and enlarging to make it more generally useful. The study of woods, their structure and capabilities, are occupying much more attention now than they hitherto have done, owing to the extension of Forest Schools, and the subject being taken up as a special study; therefore, a really good book, on the lines of the one under consideration, would be most valuable.

The title of Dr. Hartig's little volume is somewhat pretentious, if not misleading, for a large portion of the plants mentioned are not timber trees at all, as, for instance, the vine, barberry, buckthorn, &c.; and it requires a great stretch of the imagination to consider the rose a timber tree, though on p. 44 we find, "Rosa, Tree Rose," with the information that "The 'Rosewood' of commerce is got from various, especially Asiatic, species of trees." Now the commercial rosewoods are all obtained from Brazil and Central America, and are furnished, so far as our present knowledge goes, by one or more species of *Dalbergia*. J. R. J.

Articles in Journals.

Annals of Botany (Sept.). — F. W. Oliver, '*Sarcodes sanguinea* Torr.' (5 plates).—H. N. Ridley, 'Method of fertilisation in *Bulbophyllum macranthum* and allied Orchids' (1 plate: *B. striatellum*, sp. n.). — M. M. Hartog, 'A Monadine parasitic on Saprolegnieæ' (*Pseudospora? Lindstedtii*, sp. n.: 1 plate).—F. O. Bower, 'On antithetic as distinct from homologous Alternation of Generations in Plants.' — J. R. Vaizey, 'Alternation of Generations in Green Plants.' — G. C. Druce, '*Spergula pentandra* as an Irish plant.'* — J. R. Green, 'Changes in endospermum of *Ricinus* during germination.'

Bot. Centralblatt (Nos. 36–38). — K. Leist, 'Beiträge zur vergleichenden Anatomie der Saxifrageen.' — (No. 39). A. Hansgirg, 'Ueber die Verbreitung der reizbaren Staubfäden und Narben, sowie der sich periodsch oder blos einmal öffnenden und schliessenden Blüten.'

Botanical Gazette (Aug. 25). — C. Warnstorf, 'North American *Sphagna*.'— C. Robertson, 'Flowers and Insects.' — K. E. Golden, 'Fermentation of Bread.'

Botaniska Notiser (häft 4). — A. Berg, 'Lichenologiska anteckningar.' — H. Samzelius, 'Vegetationsiakttagelser inom Pajala socken af Norrbottens län.'

Botanische Zeitung (Aug. 29).—G. Klebs, 'Einige Bemerkungen über die Arbeit von Went 'Die Entstehung der Vacuolen in den Fortpflanzungszellen der Algen.'—(Sept. 5). E. Loew, 'Ueber die Metamorphose vegetativer Sprossanlagen in Blüthen bei *Viscum album*.'

Bull. Soc. Bot. France (xxxvii.: Comptes rendus 3: Sept. 1).— D. Clos, '*Phillyrea, Phillirea, Philyrea*.' — Id., 'Répartition en France des *Cratægus monogyna* et *oxycanthoides*.' — A. Battandier, 'Aristide Horace Letourneux' (1820–1890). — H. de Vilmorin, 'Conservation du *Melhania Melanoxylon*.' — W. Russell, 'Sur les faisceaux corticaux de quelques *Genista*.' — E. Aubert, 'Sur les acides organiques chez les plantes grasses.' — M. Miégeville, 'Sur quelques plantes des Pyrénées.' — E. Bornet, *Fauchera microspora*, sp. n., & *Zosterocarpus Œdogonium*, gen. n. (1 plate).—P. Duchartre, 'Fleurs monstrueuses de *Cattleya*.'— H. Léveillée, 'Action de l'eau sur les mouvements de la sensitive.' — E. G. Camus, Formes de *Primula*. — H. Devaux, 'Enracinement des bulbes et géotropisme.' E. Jauczewski, 'Sur l'autonomie spécifique de l'*Anemone montana*.'

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* See p. 302.

Gardeners' Chronicle (Aug. 30). — *Nepenthes stenophylla* Mast., sp. n.—(Sept. 6). H. Friend, 'Fungus on Herb Paris' (fig. 45).—(Sept. 13). E. Bonavia, 'Fertilisation without Pollen.'—(Sept. 20). *Masdevallia fulvescens* Rolfe, n. sp. (fig. 65).

Journal de Botanique (Aug. 1). — C. Sauvageau, 'Sur la feuille des Hydrocharidées marines.'— —. Hue, 'Lichens de Canisy et des environs.'

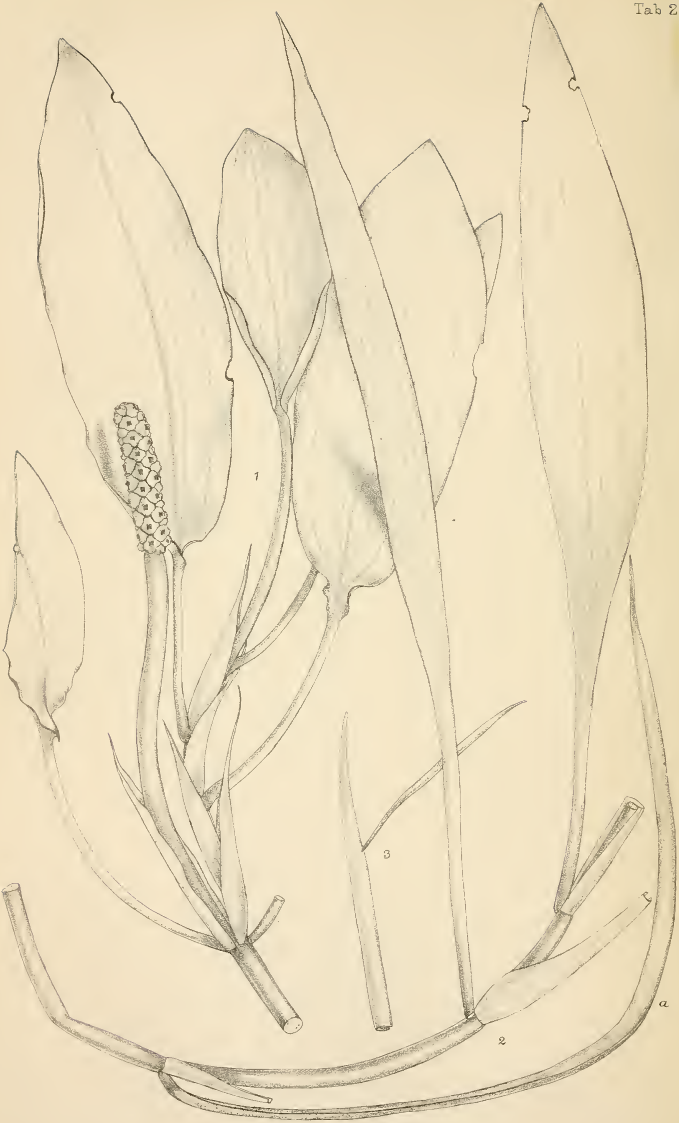
Oesterr. Bot. Zeitschrift. (Sept.).— H. Zukal, '*Epigloea bactrospora*' (1 plate).—E. Heinricher, 'Blüthen vom *Symphytum officinale* mit einer äusseren Nebenkrone.'—L. Simonkai, *Trifolium perpusillum*, *Sedum deserti-hungarici*, spp. nn.

OBITUARY.

The name of Lydia Ernestine Becker is chiefly known in connection with the "Women's Suffrage" movement, and it may surprise some to find that she had any claim to notice in these pages. But at one time of her life she paid much attention to Botany, in which indeed she always retained her interest. She was born in Cooper Street, Manchester, on February 24th, 1827. When about eleven years old her family removed to Altham, near Accrington, where the greater part of her life was spent, and where her love for flowers developed. She gave lectures on Botany in girls' schools, and in 1864 published under her initials a little introductory book entitled 'Botany for Novices.' It was while at Accrington that she was struck with the remarkable appearance of some flowers of *Lychnis diurna* attacked by a parasitic fungus, and on this she read a paper before the British Association in 1869, a summary of which will be found in this Journal for that year, p. 291.

Her political career need not be referred to here; but it may be noted that those who knew her bear warm testimony to the care and affection with which her domestic duties were discharged, and to the womanliness of her character. Their testimony, indeed, runs counter to the popular conception of the prominent advocate of "Women's Suffrage." Sketches of her life and character will be found in the 'Women's Suffrage Journal' for August last,—a periodical which she established more than twenty years ago and has conducted throughout, and which ends with her life.

In June, Miss Becker went to Aix-les-Bains for the benefit of her health. She derived much benefit from the change, and proceeded to St. Gervais-les-Bains in July. Here, however, she became worse; she with difficulty proceeded to Geneva, and died within a few hours of her arrival on the 18th of July. She was buried on the 21st in the cemetery of St. George, at Geneva. A portrait of Miss Becker was painted five or six years ago by Miss S. J. Dacre, which it is hoped may be secured for the National Portrait Gallery.



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Potamogeton crassifolius.

ON A NEW HYBRID *POTAMOGETON* OF THE *FLUITANS* GROUP.

By Alfred Fryer.

(Plate 299.)

Potamogeton crassifolius mihi = *P. Zizii* × *P. natans.*—*Rootstock* with thick stolons, rooting deeply in the soil; *stem* 4–5 ft. long, very stout, round, simple below, branched above with simple branches; *leaves all stalked, coriaceous, opaque when mature; lower leaves* reduced to submerged phyllodes, or narrowly lanceolate and tapering into the petiole, or with a distinct lanceolate lamina, *all thick and coriaceous like the upper ones;* distant, few in number, *usually all decayed by the time of flowering; upper leaves very thick and fleshy*, oblong-elliptical, or oval, with a *prominent fold at the base* of the lamina, which is slightly decurrent, or rarely lanceolate and gradually narrowed into the stalk; *petiole flat above*, slightly enlarged towards the apex, *shorter than the lamina; stipules* not winged, *not channelled on the back*, but with two conspicuous green ribs, horny with scarious edges, or herbaceous, *acute;* lowest sometimes bearing a short phyllode, or more rarely a long lanceolate ordinary lower leaf; *peduncles of equal thickness throughout*, terminal becoming lateral by growth of the branch, equalling or slightly exceeding the stem in thickness, 2–3 times as long as the flower-spike, much shorter than the subtending leaves; *flower-spike* cylindrical, dense, 1–1¼ in. long, usually (always?) barren, perianth-leaves closed at the time of flowering, but the stigmas exserted; *colour* of the whole plant *bright green*, or with the young upper leaves sometimes reddish or streaked with reddish purple.

Potamogeton crassifolius differs in its parentage from *P. fluitans* Roth, being a hybrid between forms of *P. Zizii* and *P. natans*, instead of between *P. lucens* and *P. natans*. It varies slightly from the type described above, because in different localities it originates from different forms of *P. Zizii*, and because the seed-parent is sometimes *Zizii* and sometimes *natans*. The type of the species (figured Pl. 299) is a very robust plant, growing in deep water, and, although springing from a single rootstock, spreading along the water for a distance of 10 or 12 yards. In habit and general appearance it closely resembles a large form of *P. Zizii* (*P. coriaceus* v. *major* mihi), which grows in the same drain intermixed with *P. natans*, and probably it is *coriaceus* ♀ × *natans* ♂. The upper floating-leaves of *coriaceus* v. *major* and *crassifolius* so closely resemble one another in some specimens that the plants are with difficulty separable, except by examination of the widely different lower leaves. In the Mepal Engine Drain, where three separate stations have been found, *P. crassifolius* is always accompanied by *P. Zizii*, and I have met with it in no locality where that species does not exist. In another locality,—at Westmoor, in the parish of Doddington,—some miles distant from the Mepal station, no doubt about its parentage is possible, as only *P. Zizii* and *P. natans* are able to flower in the shallow ditch in which it grows. This ditch has been carefully examined for water-plants by me for some years past, but no *fluitans*-forms were detected until the present season, when I was surprised at finding numerous young plants, apparently seedlings in their second year. As I at once saw by the thickly coriaceous lower leaves that these young plants belonged to *P. crassifolius*, I carefully examined the vegetation of the whole ditch, which then contained water only two or three inches deep along its whole course. At the upper end a single patch of *P. natans* grew with here and there a plant of *P. plantagineus*, but neither of these species was in flower, nor pushing up flower-spikes. About fifty yards lower down the ditch *P. Zizii* became very abundant and flowered freely, and amongst this species I found a single plant of *P. natans*, which had spread out into a small patch, showing it had occupied that station for some three or four years: immediately below this, and for the distance of 60 or 70 yards, single young plants of *P. crassifolius* grew; they were not scattered irregularly over the bottom of the ditch, but grew on one side of it, just where the flow of the water would carry the seeds when the drainage-mill was at work. Now this ditch for some years has been completely isolated from the main drain, into which it flows, except by a narrow tunnel at the end of the ditch, through which no fragments of plants or seeds could easily pass. No plants of *crassifolius* were found at this lower end of the ditch, so it was evident that they had not been introduced from the main drain. At this lower end a few dwarf plants of *P. lucens* were growing, but the water was too shallow, and had been for some years, to allow them to flower; besides, the plants of *crassifolius* did not grow near the *lucens* plants, and there is no upward flowing of the water to have carried their seeds to where the plants of *crassifolius* grew, even if they had been able to flower.

I have been thus minute in describing this locality, because it affords one of the strongest proofs of natural hybridity in Potamogetons that it is possible to meet with. So thoroughly had this particular ditch been examined by me for some years past that I can safely affirm that these seedlings did not exist before the summer of last year, when they would naturally be too small to attract attention.

Hitherto I had found it difficult to understand how a *whole spike* of flowers could become fertilised by the pollen of another species of *Potamogeton*, as the flowers in this genus do not seem to be usually visited by insects; and in fact, in the two species in question, the spikes are frequently much interrupted by the abortion of many ovules. The careful examination of the plants in this same ditch, however, enabled me to arrive at a solution of the difficulty. A single spike only of *P. natans* was produced on one of the plants near the centre of the ditch, and of this the pistils were exserted and receptive before any pollen was ripe. As no other spike of *natans* occurred in the ditch, this solitary one must, if impregnated at all, depend upon fertilisation by such pollen of *P. Zizii* as would be carried to it by the wind, or by closely contiguous spikes of that species being brought into actual contact with it by the force of winds or the movements of aquatic animals.

As far as I have been able to observe, the anthers and stigmas of Potamogetons sometimes ripen together, and sometimes one or the other ripens first, or the stigmas in succession. Here, then, we have a clue to the irregular fertilisation of the spikes in this genus, and an explanation of how a spike of ripe pollen of one plant accidentally dashed against the receptive spike of another plant in which the pollen was immature might fertilise every ovule. By actual experiment I have seen how easily this might be done; and whoever has watched the movements of a water-rat will readily understand how contiguous spikes may be brought into contact with sufficient force to dust every stigma with pollen.

In this Westmoor variety of *P. crassifolius* the upper floating-leaves are narrowly oblong-lanceolate, and make a decided approach to those of narrow-leaved forms of *P. natans*, and, although they have no discoloured joint, they often bend back like those of *natans*. This variety grows freely under cultivation, but has shown no signs of flowering as yet.

One other form of *P. crassifolius* deserves mention, because it shows some indications of partial fertility, as the drupelets swell to some extent, and do not decay like those of *P. decipiens* and other infertile hybrids. These immature drupelets were gathered too young to afford any specific characters; they may be roughly described as oval-oblong with compressed sides, bluntly keeled on the back, with a turgid beak broad in proportion to the rest of the fruit. All these characters, however, may have little permanence, and be merely the characters of immaturity. The upper floating-leaves of this variety are orbicular-ovate, and somewhat ribbed on the under surface, like those of *natans*. The young growth is that of typical *crassifolius*.

Besides in its parentage, *P. crassifolius* differs from *P. fluitans* Roth in the following respects:—The mature lower leaves are opaque and coriaceous like the upper ones; in many instances they are not at all membranous even in the earliest stages, but are leathery in texture from the first; they are usually all decayed by the time the plant is in flower, and the whole plant decays by the end of August, at which time *P. fluitans* is in full growth. Although the whole mass of foliage floats near the surface at the time of flowering, even the uppermost floating-leaves are partly submerged, like those of *P. coriaceus*, none growing so fully exposed to the air as those of *fluitans* and *natans*. The upper leaves are more distinctly auricled at the base, and are more abruptly narrowed into the petiole, and the lamina is oval and bluntly mucronate, instead of lanceolate or elliptical and acuminate. The petiole is flat above, not conspicuously convex as in *fluitans*. And lastly, the stipules are flat on the back instead of being deeply grooved, and are "fibro-scarious," and soon decaying like those of *natans*.

I have seen no plant in any herbarium which I can refer to *P. crassifolius*, so at present I can only record it from the parishes of Mepal, Chatteris, and Doddington, all in District 7 of Cambridgeshire, Co. 29.

By the great liberality of Dr. Gustaf Tiselius, of Stockholm, and of Mr. Charles Bailey, of Manchester, who have kindly lent me two valuable sets of continental "*P. fluitans*," I have been able not only to compare my series of British *fluitans*-forms with those of other countries, but to obtain a fair notion of what botanists generally mean by "*P. fluitans*." Amongst the plants sent to me the majority seems to be formed of hybrids of *P. natans* crossed with *P. lucens*, or in some instances, perhaps, with *P. polygonifolius.* Of the small minority of more doubtful *fluitans*-forms, one, *P. Illinoensis* Morong, belongs to the *Zizii* section of *P. lucens*, and the others are freely fruiting plants, which seem to me specifically distinct from the rest of the group, and which would be more naturally placed between *P. natans* and *P. polygonifolius* than with a species which so closely approaches *P. lucens* as *P. fluitans* of Roth.

Taking the name *fluitans* as used by botanists, it represents an aggregate as wide as the old *P. natans* before the segregation of *polygonifolius*, *plantagineus*, and *fluitans* of Nolte. Acting on the same principle as that which seems to have guided Dr. Tiselius in his limitation of the *nitens*-group (*i. e.*, that all *nitens*-forms should be hybrids with *perfoliatus* as one parent), I propose in like manner to restrict the *fluitans*-group to such forms as are hybrids with *P. natans* as one parent; and to restrict the name *P. fluitans* Roth to the plant figured by Reichenbach, 'Icones,' f. 88, which plant I have shown in previous notes to be almost certainly *P. lucens* × *P. natans.*

This, the typical form of the group, agrees well with Roth's original description,* and I follow Reichenbach and Tiselius in considering it to be the form on which Roth founded his species. Nor am I deterred in thus restricting the species by any fear that Roth, or other botanists, may have subsequently described the fruit of other forms supposed to be identical with his original plant. Until a plant agreeing with Roth's description and Reichenbach's figure shall be found in fruit, I consider the supposition that Nolte's species does fruit as having no substantial foundation. That this species may occasionally produce single drupelets fertilised by the pollen of other species I fully admit, but these possibilities are beside the present question, which is: has the plant described by Roth ever been found in a fruiting-state? It is not a matter of opinion, but a simple matter of fact; thousands of barren specimens are known to exist, but in what herbarium can we find a single fertile specimen?

It is true that Dr. Tiselius, whose profound knowledge of the genus *Potamogeton* demands the greatest respect, considers a fruiting form found by him in the Neckar, near Heidelberg, to be specifically identical with the plant figured by Reichenbach,

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* See Mr. W. H. Beeby's note in the July number of the current volume of this Journal, p. 203.

'Icones,' f. 88. But by also admitting such a plant a *P. Illinoensis* Morong as equal to *P. fluitans* Roth, it is evident that in this instance he takes an extremely wide view of the term "species," since *P. Illinoensis* is a form which might very well pass for a variety of *P. coriaceus*.

After having carefully compared the very beautiful and complete specimens from the Neckar, in Dr. Tiselius' herbarium, with a fine series of Swedish and British forms (which exactly agree with the description of Roth and the figure of Reichenbach), I am unable to regard them as belonging to the same species. If we are to admit such forms as the Neckar plant and *P. Illinoensis* of Morong to be *fluitans*-forms, then we ought also to include in the same group such plants as *P. coriaceus* and the large deep-water forms of *P. polygonifolius*, a length which few botanists would feel disposed to go.

How far Dr. Tiselius and I agree about the true nature of *P. fluitans*, as figured in the 'Icones,' may be seen by the following extract from a recent letter, which I have his kind permission to publish:—"In the case of *P. fluitans* Roth, it has sometimes occurred to me that *P. fluitans* might be *P. natans* × *P. lucens*, but the remarkable thing about that hybrid would then be that it is never difficult to distinguish it from its parents as are the hybrids of *nitens*, of *gramineus*, &c. In this country the plant is no longer found growing in but one place, *i. e.*, Wallstanäs, where I recently found it. How did it come thither? Possibly brought by birds? Certainly both *natans* and *lucens* grow there, but no form of *fluitans* can be taken for *natans* or *lucens*. In this country *fluitans* is not found with fruit, but, as you have probably noticed, I did find it with fruit, somewhat developed, in the Neckar, and believe I know the plant well. In the localities where it was formerly found in this country it has died out for the past fifty years; I can take young wild specimens, in every respect similar to the cultivated ones you were so good as to send me, in abundance at Wallstanäs. It is a remarkable plant which, it seems to me, must be looked at as a species, in the sense that, as you remark, many a plant now considered as being a species was originally an hybrid, and that in process of time hybrids can produce fertile plants. Our cold climate and water may be the reason that the leaves rot away before any fruits have time to grow. The spikes seldom rear themselves above the water, because here at Wallstanäs the plant is drawn down by running water, but that is no proof that the plant cannot produce ripe fruit, since fertilisation can go on under water, as, for instance, in the case of *P. marinus*, which, in this country, never rears itself above the water, but nevertheless produces abundance of ripe fruits" (Dr. Gustaf Tiselius *in litt.* July 14th, 1890). Taking the plant of the 'Icones' as the type of *P. fluitans* Roth, I would place under it the Swedish plant from Wallstanäs and the British plants gathered by Mr. W. H. Beeby in Sussex (1880) and in Surrey (1886), and those gathered by myself in Huntingdonshire (1884) and in Cambridgeshire (1885). This form is also found in many continental localities, as far as one can judge from the very insufficient specimens usually distributed by collectors.

The most nearly-allied form to the above is my newly-proposed species *P. crassifolius*, which has already been sufficiently discussed.

Then as true *fluitans*-forms, *i. e.*, as probable hybrids with *natans* as one parent, I would place certain continental forms which present a strong resemblance to deep-water states of *P. polygonifolius*. I can give no detailed account of these in the present place, as this note is already far too long, but I will remark that *P. variifolius* Thore may possibly come under this division of the group. If continental botanists would carefully examine the waters where *fluitans*-forms grow I think they would soon be able to detect the origin of any supposed hybrids between *natans* and *polygonifolius*. Herbarium specimens may serve to suggest such an origin, but the question can only be solved by careful study of the living plants and the conditions under which they grow.

It is with diffidence that I venture to suggest that further evidence is required before the Neckar plant can be safely admitted to be a *fluitans*-form at all; judging from the dried specimens of fruits and foliage I have seen of "fruiting *fluitans*," I think it is probable that we have in these plants one or more good species whose true position would be between *natans* and *polygonifolius*, and which probably are not hybrids at all.

Explanation of Plate. — 1. Upper leaves and flowering spike. 2. Lower leaves; *a*, phyllode. 3. Detached stipule bearing a leaf.

THREE NEW LASTREAS FROM ASSAM.

By C. W. Hope.

Nephrodium (Lastrea) **assamense**, n. sp. — *Caudex* erect; *stipes* closely tufted, 8–15 in. long, densely clothed at base with linear acuminate blackish or brown scales, and furnished above, as are the rachises, with few or many broad-based long narrow hair-pointed dark brown scales; *fronds* lanceolate or subdeltoid, 9–15 in. long, 5–7 in. broad, bipinnatifid or bipinnate towards base of pinna, towards apex suddenly diminishing in width, lowest pair of pinnæ sometimes nearly as long as next pair, major pinnæ distant 4–6 pairs; *pinnæ* patent or much inclined upwards, lanceolate, acuminate, sometimes broadest at base, but there sometimes much narrowed, lowest hardly ever at all unequal-sided, and hardly more compound than others, pinnatifid to a winged rachis into oblong subspatulate segments $\frac{1}{2}$–$1\frac{1}{2}$ in. long by $\frac{1}{8}$–$\frac{3}{8}$ in. wide, somewhat cut away on upper side and decurrent on rachis on lower side, bluntly rounded and sharply toothed at point, rarely slightly pinnatifid at base in largest specimens; *segments* subentire, with teeth on both sides or distinctly lobed, one lobe to each group of veins with a sharp sometimes double tooth; *texture* herbaceous, both surfaces glabrous; *veins*, except costa, rarely visible on upper side, but all very distinct against the light, forked or pinnate in the lobes, bipinnate in lowest lobes, all terminating within the margin, fertile veinlets often much the shortest; *sori* one to each group of veins on lowest veinlet near the costa, which veinlet in fertile lobes points to the sinus, but often stops considerably short of it or is obscure beyond the sorus, but in barren lobes may be prolonged like the others, or rarely 2–3 in lowest pair of lobes: *involucres* entire, persistent.

Collected by Mr. Gustav Mann, Conservator of Forests, Assam, in Assam—in Bor Bhil, Upper Dehing Forest, Lakhimpur, April, 1887; in the Garo Hills, at 1000 ft. elevation, "on wet rocks!" in April, 1888, and November, 1889; and in the Nambar Forest, in January, 1888. Appearance, when pressed, somewhat like that of *Asplenium* (*Athyrium*) *nigripes* Mett.

Nephrodium (LASTREA) **subtriangulare, n. sp.** — *Caudex* erect, densely clothed with linear chestnut scales; *stipes* tufted, wiry, as long as or longer than frond, round below and slightly channelled above, as is also the main rachis, clothed at base with dark brown linear lanceolate scales longer than those on caudex, sparser and paler upwards; main and secondary *rachises* slightly squamiferous, secondary rachises grooved above and on sides, round below; *frond* 14 in. long by 10 in. broad, very broadly lanceolate-acuminate, bipinnate; *pinnæ* opposite at base of frond, gradually becoming alternate upwards, 8–10 pairs free, lanceolate-acuminate, falcate, all unequal-sided, and all except lowest pair very slightly narrowed at base; lowest inferior pinnules on lowest pinnæ very much shorter than next three or four; *pinnules* numerous, lower,—subsessile, with slightly winged stalks, upper,—sessile, gradually becoming decurrent on rachis, and towards apex confluent: *pinnules* lanceolate, falcate, rather blunt-pointed, the entire apex slightly toothed; *lobes* or *segments* inclosing groups of veins increasingly distinct towards base of pinnule till the dividing sinus sometimes nearly reaches costa, usually with only one tooth corresponding to uppermost veinlet of group, and that pointing upwards and sometimes inwards to next lobe above, so as to lie within general outline of pinnules; *texture* herbaceous, *surfaces* glabrous; *veins* invisible above, except costæ, not raised beneath, pinnate or rarely bipinnate in lobes, and terminating within the margin; *sori*—on upper pinnæ uniserial, near the costa on inner veinlet of each group of veins,—on lower pinnæ becoming more copious, and borne on both sides of main vein of segment; *involucres* entire, shrivelling, dark-coloured.

Collected by Mr. Gustav Mann, Conservator of Forests, Assam, in Assam, at Laukot, southern face of Khási Hills, 800 ft. elevation, in September, 1888, and in the Jaintea Hills, at 3000 ft. elevation, in March, 1890. Mr. Mann says the plant is rather rare, and he would place it between *Nephrodium* (*Lastrea*) *assamense* (Hope) and *N.* (*Lastrea*) *Filix-mas* (Rich.), var. 2 *normalis* (Clarke in Trans. Linn. Soc., 2nd Ser., Bot., vol. i., p. 519). The present species seems to me, however, quite different from *N. assamense*, and it can be easily distinguished from Clarke's plant by the scales, shape of frond and cutting of the pinnules, by the veins, and by being soriferous on all the pinnæ. In Clarke's fern, which has no affinity to *N. Filix-mas*, and which was previously named by Moore, from Beddome's specimens, *Lastrea odontoloma*, sori are never found on the lowest pair of pinnæ, seldom on the lower 3–6 pairs, and are sometimes confined to the upper part of the frond. I have had difficulty in naming this plant, owing to the absence of any very striking features, and to there being already a *Nephrodium* (*Lastrea*) *latifrons* Hook. and a *Nephrodium* (*Sagen.*) *latifolium* Baker.

Nephrodium (LASTREA) **coriaceum**, n. sp. — *Caudex* erect; *stipes* closely tufted, stout, 5–12 in. long, thickly clothed with long linear hair-pointed dark chestnut scales at and near the base, and above, together with main rachis, closely covered with minute raised dark-coloured points, the scars of scales which quickly fall off; *rachises* rather densely furnished with dirty-brown hair-like scales with adpressed ovate bases; *frond* lanceolate-deltoid, acuminate, 9–15 in. long by 6–10 in. broad, subbipinnate, with 8 or 9 pairs of quite free pinnæ, and 20–25 pairs of small sessile falcate pinnæ rapidly diminishing to mere lobes in the pinnatifid apex; lowest pinnæ the longest, and at the base widened on the inferior side by the prolongation of one or more pairs of pinnules; *pinnæ* diminishing in width regularly to apex, but lowest pair of pinnules much longer than next above, and inferior pinnule of that pair longer and broader than the superior, and more out of proportion on each successive pinna towards the base of the frond; *secondary pinnæ* catadromous, except on lowest pair of pinnæ, where they become anadromous owing to the omission (for want of room) of lowest inferior pinnules; *pinnæ* more and more deeply cut into segments downwards from confluent apex to base until pair next main rachis become quite free, cordate and stalked pinnules; in large fronds two pairs of *pinnules* on two lowest pairs of pinnæ free, and these disproportionately long, inferior ones being 2½–3½ in., and becoming compound at base; *segments of pinnæ* broadly falcate, rounded to a sharp point, and in upper parts of frond and pinnæ usually entire to near the point, where they are slightly serrated, in large fronds pinnules or segments of pinnæ crenate on sides, lowest enlarged ones becoming pinnatifid, like the smaller pinnæ; *texture* very thick, coriaceous, and tough, with lamina sometimes opaque; *colour* pale greyish green, upper surface glabrous, costæ and veins below squamiferous; *veins* obscurely traceable above, slightly raised below, more or less visible against light, forked to pinnate; *sori* on inner veinlet of each group of veins, but not extending to apices of segments, submarginal, and in the enlarged pinnules of compound fronds appearing to be at sinus between the lobes, with rarely one more on upper edge of lobes; *involucres*, when not shrivelled, apparently orbicular.

Collected by Mr. Gustav Mann, Conservator of Forests, Assam, at Kopili Hot Springs, North Cachar Hills, Assam, at 1000 ft. elevation, February, 1890. Three pairs of mature fronds received, two of which have one barren and one fertile frond each, the stipes of the barren fronds being only half to three-quarters as long as those of the fertile, and the barren fronds being less compound. The ears, or enlarged pinnules, are parallel to the other pinnules, not deflexed. The plant seems quite unique in its genus, so far as Indian ferns go, the texture and cutting reminding one of small

Pteris aquilina, though the specific gravity of this fern must be much the greater. The upper surface looks almost like embossed leather. As shown by the scars of fallen scales, the stipe and rachis when young are very thickly clothed. Mr. Mann says this is so.

IN MEMORY OF MARIANNE NORTH.

On the 30th of August last this talented and remarkable woman was released from suffering and passed away in her beautiful home at Alderton, in Gloucestershire, whither she had retired to spend in quiet the all too brief evening of an active and productive life. Thousands of persons scattered all over the world, who know the name and work of Marianne North, would doubtless fain learn something more of her to whom we are indebted for so much enjoyment, in her gallery at Kew, of "paintings of plants and their homes." It was there, while busily engaged on her work, that I made the acquaintance of Miss North, and it is of her work and working that I would specially write. I will first, however, give a few particulars of her earlier life, taken from a sketch by one of her friends, which appeared in the 'Queen' some years ago.

Marianne North was born at Hastings in 1830, and was the daughter of Mr. Frederick North, of Rougham, in Norfolk, who was for some time M.P. for Hastings. Her mother was the eldest daughter of Sir John Majoribanks. Music and painting were her natural gifts; and she early developed the great skill in painting flowers that has rendered her name famous. Frequent travel gave her opportunities for exercising this talent, until it grew into an all-absorbing passion. The years 1865 to 1867 she spent with her father, chiefly in Syria and up the Nile, and a series of sketches made during this period received high praise from competent judges. Mr. North died in 1869, and thereafter his daughter devoted her life to painting. In 1869–70 she travelled and painted in Sicily; but, so far as I remember, only one of the paintings made in that country is in the collection at Kew. It is interesting, as representing a group of papyrus growing in the River Ciane, the only locality in which it is found wild on the European side of the Mediterranean, where it may possibly have been introduced. In 1871 or 1872 Miss North visited North America and the West Indies, and painted assiduously, spending more than two months in solitude in a lonely house amongst the hills of Jamaica. Many of the paintings made on this journey are in the gallery at Kew, and I believe they were the first submitted to botanical scrutiny; a small selection of them was sent to Sir Joseph Hooker at the Kew Herbarium. Her next voyage was to Brazil, where she was received with much distinction by the Emperor; yet she lived the greater part of the time in a deserted hut in the forest, and her provisions were taken to her from a distance of eight miles by a slave woman, who is commemorated in one of the paintings at Kew. On the return journey Miss North called at Teneriffe. Then followed a trip round the world, with stoppages for work in California, Japan, Borneo, Java, Singapore, and Ceylon, and thence homeward again. The same year she returned to India, visiting the forests of the Himalayas, the chief places of note on the Ganges, and Bombay; and during her absence some five hundred of her paintings were exhibited at South Kensington.

It was after her return from India that she first broached the idea of presenting her collection to the nation, and arrangements were made for the erection of a suitable building in Kew Gardens at her expense. In order to render the collection more nearly representative of the Flora of the world, Miss North next proceeded to Australia, Tasmania, and New Zealand, and the fruits of this long journey are perhaps the finest of the collection, very fully illustrating the most striking features of the marvellous Australasian Flora.

In 1881 the gallery was so far advanced that the hanging of the paintings could be taken in hand; but this was a long and toilsome task. The paintings were so numerous that it was necessary to hang them close together, and cover the walls from the cornice to the dado, involving months of labour in adjusting, reducing, painting odd bits here and there, putting in little accessories, touching up, and finishing up generally. A catalogue had to be prepared before opening the gallery to the public. Miss North had intended to do this herself, but she foresaw that the interest and use of the collection might be considerably enhanced by a more detailed catalogue than she could compile unaided. With this view she applied to Sir Joseph Hooker, who introduced me to her for the purpose. I was at once struck by her stately presence and gentle sympathetic manner, and I soon learnt what a noble generous nature she possessed. But even at that period travel and incessant work, and the very trying task of hanging the pictures, from which she would allow herself no rest, had made serious inroads on her constitution, and one was too often painfully conscious, especially in the after part of the day, of an expression of weariness she could not conceal.

I spent more than three months in preparing the first edition of the catalogue, and during the whole of this time Miss North was there almost daily, superintending alterations, painting the doors, the panels in the upper gallery, or giving me all the information she could to aid in identifying the plants. Between us at Kew we succeeded in naming almost every plant, so faithfully were they painted. The principal difficulty was, while admitting interesting facts concerning their history, uses, and homes, &c., to keep the catalogue within reasonable dimensions. However, by dint of hard work up to the very day, this unique present to the nation was thrown open to the public on July 9th, 1882. By the end of July the first edition of the catalogue, an impression of 2000, was sold out, and in less than a year another edition of 5000 was sold, —the best evidence that could be had of the popularity of the gift. This, as I have reason to know, was highly gratifying to Miss North, for, much as she disliked ceremony and empty flattery, she was keenly sensitive, and, in spite of her self-reliance and conscious power, she awaited the verdict of the impartial public with some anxiety.

No sooner was this work completed than Miss North began to make arrangements to visit South Africa, Madagascar, Mauritius, and the Seychelles; but she was unable to carry out the whole of this programme in consequence of the long intervals between the ships sailing, quarantine arrangements, &c. She intended leaving early in August, but delays arose from various causes, and I believe it was October before she left.

As a specimen of her letters, I will give one from South Africa, dated 9th December, 1882, which shows how bravely she was struggling against breaking health and diminishing strength. It also testifies to the independence of her character, and her hearty recognition of similar tastes and a love of nature in others, quite apart from the social position of the person. Pedantry she abhorred, and she prided herself, I think I may say, on placing, perhaps somewhat ostentatiously, worth before wealth or station:—

" . . . . I am very tired and older every day, but this country is worth some fatigue to see. What lies people tell about it! Over and over again I have been told it is the most wretched country—no flowers, nothing! and I find quantities of the most beautiful things on every side. I have been staying a month here, though I only thought to stay three days. I have done ten large paintings and three half-size. I have left eighteen large ones on the walls at Mrs. Brounger's [at Wynberg, Cape Town.] I came overland to Port Elizabeth, driving over the desert Karroo, and even there I found treasures, and saw wonderful effects of mirage and wild deer and long-legged birds. The railway down to the sea took me through the most glorious swampy valley of Euphorbias, prickly pears, and Aloes, with red flowers, often higher than men, all tangled up in ivy geranium and Plumbago in full flower, and the lovely wild vine, Cephalandra, with creamy flowers and scarlet egg-fruit, hanging in the most lovely festoons. And every now and then we came to groups of Kafir-huts, and grand people stalking about in bright red drapery and feathers in their heads, like Mephistopheles on the stage. It was all too wonderful! A tame ostrich, too, walked on to the platform and made faces at the train at one of the stations. Port Elizabeth is quite a model little town for neatness and comfort, with the most delicious supply of water brought thirty miles from the gorge near this. I rode up there one day with a first-rate botanist, Mr. Hallack (also a grocer), who came over from Saturday till Monday on purpose to take me. He is really a charming man, such as are rare in any quarter of the world, and it was a great treat having a day with him. We found three sorts of *Harveya*. I have painted four: they are so very lovely, and said to be parasites. On the very edge of the waterfall we found quantities of *Disa*, small but exquisite, growing (like its grand relative on Table Mountain) with its roots in the running water; and blue Agapanthus, Zamias and Euphorbias were clinging to the rocks above us, with any quantity of Gladiolus, ferns, and other lovely things. We returned over the downs on the other side of the mountains, and found all the finest Proteas, most gorgeous, though nearly out of bloom ; also *Sparaxia pulcherrima*, pink bells waving in the wind on nearly invisible stalks. This house is quite perfect quarters—farm-house and hotel combined—with the kindest people, who treat one like an old friend. It is quite solitary, with open flowery country all round, and deep cracks in the table-land filled with the richest tangled forest. The sides of these 'kloofs' are so steep that one hardly sees them till one reaches the very edge, and they are haunted by huge baboons ; and a leopard was caught lately a few miles off. I am warned to be careful; what that means exactly I do not know ! so I only go as far as my strength allows me. One can but die once ; anyhow, it does not much matter to me. I leave this on Monday for a few days amongst the spekbooms (*Portulacaria afra*) and possible elephants. I then go up the Zuurberg, and on to Grahamstown, the Catberg, King, Queen, and East London, and again back and to Knyssa Forest, and hope to get back to the Cape in February to see the great *Disa* and summer flowers on the mountain and paint some landscapes, with the silver forests. It was too cold when I was there before. After that I shall go straight to Natal. I shall not be home as soon as I thought, unless I get ill, but shall want a new room at least to put all the work in."

Miss North succeeded in accomplishing the journeys and the paintings she alludes to in the foregoing letter, and returned to England in the spring of 1883, though further enfeebled by an attack of fever. However, after a few months' comparative repose, this courageous lady proceeded to the Seychelles, where she painted the peculiar palms, screw-pines, and other characteristic plants. In the meantime she had set the builders to work on a new wing to the gallery at Kew, to receive the new paintings.

I will now pass on to Miss North's last travels,—her journey to Chili in the autumn of 1884. She had painted the Brazilian Araucaria in its home, and the Australian Bunya bunya, and she wished to paint the Chilian Araucaria. In a characteristic letter, which appeared in the 'Pall Mall Gazette' in March, 1885, she thus describes her visit :—

"Soon after reaching the first Araucarias we found ourselves surrounded by them, and all other trees gave way to them, though the ground was still gay with purple peas and orange orchids, and many tiny flowers, whose names I did not know, and which I had not time to paint. Such flowers, when picked, die almost directly. Many hills and the valleys between were covered with old trees, over some miles of space, and there are few specimens to be found outside their forest. I saw none over 100 feet high or 20 feet in circumference, and, strange to say, they seemed all very old or very young. I saw none of those noble specimens of middle age we have in some English parks, with their lower branches resting on the ground. They had not become flat-topped, like those in Brazil, but were slightly domed, like those of Queensland, and their shiny leaves glittered in the sunshine, while their trunks and branches were hung with white lichen, and the latter weighed down with cones as big as one's head. The smaller cones of the male trees were shaking off clouds of golden pollen, and were full of small grubs, which, I suppose, attracted the flights of parroquets I saw so busily employed about them. These birds are said to be so clever that they can find a soft place in the great shells of the cone when ripe, into which they get the point of their sharp beak, and fidget it until the whole cracks, and the nuts fall to the ground. It is a food they delight in, and men, too, when properly cooked, like chestnuts. The most remarkable thing about the trees was the bark, which was a perfect child's puzzle of knobby slabs of different sizes, with five or six decided sides to each, and all fitted together with the neatness of a honeycomb. I tried in vain to find some system on which it was arranged. The great heads, before the flowers come out, are wrapped up in covers of white kid tinted with salmon, getting darker as they fall aside and the lemon buds push themselves out, and the first flowers which open round the base of the spikelet, near the stalk, are of the purest turquoise-blue; the new rosette which replaces them is darker, metallic blue, and then all the others seem to get more and more green and faded the farther they get from the stalk, with a background of brown bracts or leaves, the original white kid covers."

On her return from South America in 1885, Miss North at once commenced hanging the new paintings, which, including those from South Africa and the Seychelles, are some two hundred in number. Among the latter was the "Capucin," an imperfectly known sapotaceous tree, which had been referred by Prof. Hartog to *Mimusops*. The drawing of the foliage and fruit brought by Miss North, with the flowers, which were subsequently sent at her request, enabled Sir Joseph Hooker to determine the tree to be a new genus, which he appropriately named (Ic. Pl. 1473) *Northea*, in honour of the artist. Miss North is also commemorated in *Crinum Northianum* Baker and *Nepenthes Northiana* Hook. f., the former of which was described from her drawings,—the highest compliment which could be paid to their scientific accuracy.

In 1886 the Government printed a new catalogue, including the above additions, and withdrew the large number of unsold copies of the third edition; they also returned the cheque which Miss North had actually tendered to buy up the whole stock of this now obsolete catalogue.

It may be interesting to add here some statistics of the contents of the gallery. Out of about 200 natural orders of flowering plants, as limited in Bentham and Hooker's 'Genera Plantarum,' 146 are represented in this collection of paintings, and the plants depicted belong to no fewer than 727 different genera. With regard to species, the number actually named is under 900; but as specific names have only been given to such as could be identified with ease or without too great an expenditure of time, this number is considerably below the total number painted. They are included in 848 paintings; and when we know that they were all painted between 1872 and 1885, and that they by no means represent all the painting done during that period, we can realize to some extent the intense application of the artist. But her rapidity of execution was as marvellous as her fidelity to nature and her staying power.

Soon after the completion of the new arrangements, Miss North retired to Alderley, and rarely went to London. Her last visit to the gallery was about the end of February, 1888. It was evident then that her repeated references to approaching death were not the outcome of a morbid imagination, induced by over-work. After her return to Alderley, in 1888, she was very ill, but she partially recovered; and, in spite of occasional relapses, she enjoyed her garden of flowers, and entertained a few visitors.

Miss North was not a botanist, though she painted so accurately that many persons naturally supposed that she was. She remembered the botanical names given her fairly well, and she knew well the external morphology of the flowers she painted, but she never attempted to master the technicalities of systematic botany. Yet she was a great observer, otherwise her work could not have been so accurate, and would not have formed so enduring a memorial of her as it is now likely to do.

W. B. Hemsley.

FRESH-WATER ALGÆ OF ENBRIDGE LAKE AND VICINITY, HAMPSHIRE.

By John Roy, LL.D.

The material on which the following list is founded was gathered in February, in the years 1888–89, in Hants, in the neighbourhood of Newbury. The best gatherings were from Enbridge Lake (= E. in the list); the others are from—Woolton Pond (= W.); Ball Hill Pond (= B.); Red Pool, High Clere (= R.); Millford Lake, High Clere (= M.); Malverley West Pond (= P.); and Hampstead Park Pond (= H.).

My attention being mainly directed to Desmids, it is very likely that several of the other Algæ were either not noted or overlooked; also at that season many of them, such as *Œdogoniæ*, *Spirogyræ*, &c., could not be named with certainty. Not pretending to know Diatoms critically, none are entered in the list; it may be mentioned, however, that the favourite test-object, *Amphipleura pellucida* Kg. occurs in Malverley West Pond, and *Navicula rhomboides* Ehr. was seen in some of the gatherings.

My first intention was merely to publish the few species additional to those contained in Mr. Bennett's list (Journ. Roy. Micros. Soc., read 11th Dec. 1889), but on further consideration I have resolved to issue it as it is, chiefly on account of the collector, my valued friend the late R. F. O. Farquharson, of Haughton, Aberdeenshire, of whom a notice appeared in the 'Scottish Naturalist' for July last. Besides taking his full share in county business, and attending closely to the management of his estates, Mr. Farquharson found time for microscopic researches, of which he was very fond. Diatoms he knew well, and had made a large collection, but his chief microscopic favourites were Rotifers and Infusorians. He took a very special interest in investigating the flora and fauna of his own district—the Vale of Alford. He was the life and soul of its Field Club, of which he was Honorary President till his death. He was in hearty sympathy with those engaged in scientific pursuits, and to the utmost of his power aided and encouraged them. Perhaps his strongest point was his power of stimulating others. Both to him and his accomplished wife the writer is greatly indebted for collections of Desmid material from all parts of the country. For the last few years they had to pass the winter in the South of England, partly in the neighbourhood of Newbury, and the collections made there have given rise to the present paper.

Œdogonium undulatum Breb. E.
Bulbochæte setigera Ag. E.
B. rectangularis Wittr. E.
Gonatozygon Ralfsii De Bary. W.
G. Brebissonii De Bary. E.
Sphærozosma excavatum Ralfs. E.
S. granulatum Roy & Bisset. E. W. Zygospore cubical, smooth, with one or two short stout blunt spines at each angle. Length and breadth, 14½ μ; length of spine, 3½ μ.
S. secedens De Bary. E.
Hyalotheca dissiliens Sm. E. M. — *β. bidentula* Nord. M.— *γ. tridentula* Nord. E. M.
Desmidium Swartzii Ralfs. E., abundant. P.

Docidium coronatum Breb. E. This species occurred in great abundance in a gathering from Enbridge in February, 1888. *D. nodulosum* Breb. was equally abundant; but what is of special interest is that every intermediate form between the two was seen, from *nodulosum* proper, with the apex perfectly smooth, to *coronatum*, with the "corona" fully developed. Some examples had granules barely visible; others, forming a series, showed the granules larger, till finally the evidently fully-developed crenated apex of *coronatum* appeared. These two forms therefore appear to be the extremes of one species, which may be arranged thus:—*D. coronatum* Breb. The fully-developed form.—*β. nodulosum* Breb. with smooth apex. The var. *β.* is by far the commonest form in this country.

D. Farquharsonii, n. sp. B. Medium-sized, about six times longer than broad; constriction slight: ring prominent, brown; base very slightly tumid, with one or two very slight undulations near it; frond gradually tapers to about half the breadth at the slightly thickened truncate apex, which terminates with about 12 flattened elongated granules, giving it a slightly crenulated aspect; chlorophyll-bands about 6, wavy, with a clear circular space close to the apex, containing numerous moving granules; surface punctate; enveloped in a narrow mucous sheath. Length 288–384 μ; breadth at constriction, 40–42 μ; do., basal swelling, 48–53 μ; do., at apex, 22½–27 μ. This very distinct species, which I have a mournful pleasure in naming after my deceased friend Mr. Farquharson, of Haughton, has been familiar to me for several years. It is very rare, and is more frequently found among mosses on wet rocks than in pools.

D. Ehrenbergii Ralfs. E. P. M.
—*β. granulatum* Ralfs. E.
D. clavatum Kg. E. W.
D. truncatum Breb. E. M.
D. rectum Delp. E. P.
Closterium didymotocum Corda. E.
C. Baileyanum Ralfs. E.
C. obtusum Breb. E.
C. Lunula Ehr. E.
C. Ehrenbergii Menegh. H.
C. moniliferum Ehr. H.
C. acerosum Schr. E. R.
C. antiacerosum De Not. E.
C. macilentum Breb. E.
C. strigosum Breb. E.
C. Lundellii Lagerh. E.
C. gracile Breb. E.
C. Leibleinii Kg. E. W. M. R. H.
C. calosporum Wittr. E.
C. Dianæ Ehr. E.
C. Venus Kg. E. W.
C. incurvum Breb. E.
C. arcuatum Breb. E.
C. Lagoense Nordst. E.
C. striolatum Ehr. W.

C. STRIOLATUM *β*. ORTHONOTUM, n. var. E. P. W. Upper side flat, straight for about half the length of the frond; eleven to twelve times longer than broad; from one-sixth to one-fourth longer than the typical form, by two-thirds of its breadth; in colour and striation the two are similar; zygospore unknown. Length, 320–390 μ; breadth, 32 μ; do. at apex, 8–10 μ. If nothing more, this is at least a very distinct as well as a common var. It maintains its characteristics, with very slight variation, in such widely separated regions as South Africa and New Zealand. Mr. Archer considers it a good species, and probably he is right. I prefer in the meantime to put it as a var. till the zygospore and mode of conjugation are known. The conjugation of the typical (regularly curved) form is quite the same in South Africa as here. It is very well represented by Ralfs ('Brit. Desmid.' tab. xxix. fig. 2*g*). Ehrenberg gives a figure of the conjugation ('Infus.' Taf. vi. fig. xii. 6), which differs so much from that of Ralfs that it is very doubtful if both had the same species in view. Ralfs' fig. 2*h* is evidently something quite different from his 2*g*. Neither of these represents the new var., but 2*b* and 2*f*, though not very characteristic, seem to belong to it. His other figs., 2*a*, 2*d*, 2*e*, and 2*g*, undoubtedly represent the *striolatum* of Ehrenberg (*l.c.*, figs. 1–5); his figs. *c* and *h* are doubtful.

C. Malinvernicum De Not. W.
C. intermedium Ralfs. E.
C. juncidum Ralfs. — *β. brevior* (forma *brevior* et *robustior* Rabenh.). E.
C. attenuatum Ehr. E.
C. lineatum Ehr. E.
C. rostratum Ehr. E. W.
C. Kutzingii Breb. E. H.
C. setaceum Ehr. E.
C. pronum Breb. P., abundant.
C. cornu Ehr. E.
C. ceratium Perty. E. W.
C. acutum Breb. E. H.
C. linea Perty. E. P.
Penium margaritaceum Breb. E.
P. Digitus Ehr. E.
P. Nagellii Breb. E.
P. lamellosum Breb. E.
P. Libellula Focke (*P. closterioides* Ralfs). E.
P. navicula Breb. E.
P. interruptum Breb. E.
Cylindrocystis Brebissonii Ralfs. E.
Mesotænium Braunii De Bary. E.
M. violascens De Bary. E.
Tetmemorus granulatus Breb. E.
Spirotænia obscura Ralfs. E.
S. minuta Thuret. E.
S. parvula Archer. E.
Micrasterias angulosa Hantzsch. E.
M. denticulata Breb. E.

M. rotata Grev. E.
M. papillifera Breb. E.
Euastrum verrucosum Ehr. E.
E. oblongum Grev. E.
E. ansatum Ehr. E.
E. pectinatum Breb. E.
E. binale Turp. B.
E. insulare Wittr. P.
E. elegans Breb. B.
E. denticulatum Gay. E.
Cosmarium anceps Lund. E.
C. lave Rabenh. Tile-burn Pond.
C. Cucumis Corda. B.
C. pachydermum Lund. M.
C. galeritum Nord. E.
C. connatum Ralfs. E.
C. pygmæum Archer. E.
C. angustatum Wittr. E.
C. Meneghinii Breb. E. M. W. H.
C. abruptum Lund. E.
C. abbreviatum Racib. E.
C. concinnum Rabenh. E.
C. angulosum Breb. E.
C. impressulum Elfv. E.
C. striatum Boldt. E. M. H.
C. holmiense Lund. E. — *β. integrum* Nord. E.
C. tetraophthalmum Kg. E.—*β. Lundellii* Wittr. E.
C. margaritiferum Turp. E.
C. reniforme (Ag.?) Ralfs. E. P.

C. Turneri, n. sp. E. B. Ralfs includes three species under his *margaritiferum*. The first is his *margaritiferum* proper (Tab. xvi. fig. 2*b*, *c*, and *d*). It has a zygospore with elevations all over it, or, as Mr. Archer expressively puts it, "covered with bull's-eyes." The second is his *reniforme* (*l. c.*, fig. 2*a*). This has a perfectly smooth zygospore. To the third Ralfs gives no varietal name, but he figures it with its zygospore, which is covered with spines, on Tab. xxxiii. fig. 6*b* (not 6*a*). Length, 46½–48 μ; breadth, 38–39μ; do. isthmus, 12–13 μ; thickness, 25½ μ; diameter of zygospore, 44–45 μ; length of spines of do., 8 μ. It gives me much pleasure to connect the name of Mr. W. Barwell Turner, Leeds, with this very distinct species. He is a distinguished microscopist, and has done excellent Desmid work.

C. Wittrockii Lund. E.
C. subpunctulatum Nord. & Berg. E. H.
C. Blyttii Wille. E.
C. calcareum Wittr. E.
C. Botrytis Menegh. E. P. B. W. H.—*β. emarginatum* Hansg. E. B.
C. gemmiferum Breb. E.
C. ochthodes Nord. E. B.
C. subcrenatum Hantzsch. R. H.
C. Corbula Breb. E.
C. ornatum Ralfs. E.
C. gradatum Roy. B.
Arthrodesmus octocornis Ehr. E.
A. Incus Hassall. — f. *divergens* Archer. E.—f. *convergens* Archer. E.
A. convergens Ehr. E.
Staurastrum dejectum Breb. E.—*β. patens* Nord. E.
S. apiculatum Breb. W.
S. mucronatum Ralfs. E.
S. glabrum Ehr. E. Like *dejectum*, but spines straight and inflexed. Length = breadth = 19·2 μ; breadth with spines, 22·4 μ; length of spine, 6 μ; length of side in end view, with spines, 22·4 μ; do. without, 19·2 μ; diameter of globular zygospore, 25·6 μ, without spines; length of spine, 14·4 μ. Spines numerous, simple, subulate, base broad.
S. Dickiei Ralfs. E. W.
S. cuspidatum Breb. E.
S. O'Mearii Archer. E.
S. brevispinum Breb. M.
S. oligacanthum Breb. E. W.
S. Avicula Breb. E.
S. furcigerum Breb. E.

S. teliferum Ralfs. E.
S. Brebissonii Archer. E.
S. punctulatum Breb. M.
S. alternans Breb. E. P.
S. dispar Breb. E.
S. dilatatum Breb. E.
S. tricorne Breb. E.—β. Ralfs. E.
S. margaritaceum Ehr. E.
S. inflexum Breb. E. W.
S. polymorphum Breb. E.
S. gracile Ralfs. M. P.
S. paradoxum Meyen. E.
S. tetracerum Kg. E. W.
Pediastrum Tetras Ehr. E. H.
P. Heptactis Ehr. E. H.
P. Boryanum Turp. E. H.
P. Napoleonis Turp. E. H.
Staurogenia rectangularis Br. E.
Cœlastrum sphæricum Näg. E. H.
C. cubicum Näg. E.
Sorastrum spinulosum Näg. E.
Characium longipes Rabenh. E.
Dictyosphærium Ehrenbergianum Näg. E.
Nephrocytium Nægellii Grun. E.
N. Agardhianum Näg. E.
Ophiocytium parvulum Perty. E. H.
Hormospora mutabilis Breb. E.
Pleurococcus vulgaris Men. E.
Chlorococcum gigas Kg. E.
Glœocystis ampla Kg. E.
Schizochlamys gelatinosa Br. E.
Botryococcus Braunii Kg. E.
Palmodactylon simplex Näg. E.
Raphidium aciculare Br. E.
R. falcatum Corda. E. H.
R. biplex Reinsch. E.
Scenedesmus obtusus Mey. E.
S. acutus Mey. E. H.
S. antennatus Breb. E.
S. quadricauda Turp. E. H.
Selenastrum Bibraianum Reinsch. E.
Polyedrium tetraedricum Näg. E. H.
Glochiococcus hirtus Reinsch. E.
Tetrapedia Reinschiana Archer. W.
Spirulina tenuissima Kg. E.
Chroococcus cohærens Näg. E.
C. turgidus Näg. E.
Glœocapsa quaternata Breb. E.
Merismopedia glauca Näg. E.
Microcystis marginata Kirch. E.
Cœlosphærium Kutzingianum Näg. E.
Gomphosphæria aponina Kg. E.

RUBUS DUMNONIENSIS.

By Prof. C. C. Babington, F.R.S.

Rubus Dumnoniensis, n. sp.—Stem more or less arcuate, angular, furrowed; *prickles long, slender,* patent from a short compressed base on the angles; leaves 5-nate-palmate; *leaflets* coriaceous, *flat,* not wavy at the edge, finely and *doubly serrate,* with a close coat of grey-white felt and hairy beneath, all stalked; *terminal leaflet obovate, subcuspidate,* rounded and nearly entire at the base; *panicle nearly cylindrical,* leafy below, with short, few-flowered, subcorymbose, ascending branches, its rachis and peduncles hairy, scarcely felted, with many short sunken setæ, its *prickles patent,* many, slender; sepals triangular-ovate-cuspidate, hairy, felted, not aciculate, reflexed; stamens exceeding the styles; *petals pure white,* large, oval.

R. Dumnoniensis Bab. MS.

R. rotundatus? Focke! in Journ. Bot. 1890, 129.

Stem often dark purple, the prickles yellowish towards their point. Leaflets broadest above their middle. Lower branches of panicle always short, often very short. Sepals not turning up again at the end. Are the young germens downy? Petioles of the panicle rounded above, not channelled as in *R. rotundatus* Müll.; they seem also to be rounded above on the barren stem. *R. rotundatus* appears to have sessile glands, but no setæ on the panicle and falcate prickles there.

Near Plymouth in both Devon and Cornwall, in open exposed places, *Mr. T. R. Archer Briggs.*

Focke thinks it possible that this may be *R. rotundatus* Müll., but that has a remarkably spongy and very much furrowed stem, or rather it has an angular stem with depressed flat and much striated sides, forming depressed faces rather than furrows. A manuscript description by Levent says that *R. rotundatus* has "tige dressée arquée au summit." Briggs describes the Devonshire plant as more or less arcuate. I do not find the beautiful compact cylindrical panicle which we have in Devonshire amongst the French specimens of *R. rotundatus.* Genevier seems to have founded his species chiefly upon specimens from the late M. B. Levent, of Rheims; the MS. description by Levent is valuable.

Focke distinguishes this from *R. incurvatus* (Journ. Bot. 1890, 129) by that having shorter prickles and smaller pink flowers, and a long narrow panicle. I think that several other differences will be seen by those who compare the plants carefully.

I think that this is probably the same as a plant gathered by Syme at Brodick, in Arran, in Sept., 1872, and called *R. incurvatus* by Baker; and also found by me near Milford, Pembrokeshire. I cannot identify this plant with any specimen in the Herb. Genevier, or described in his Monographie. Its very near ally, *R. incurvatus*, is not found near Plymouth. Is Mr. Briggs' plant from Ermington, Devon (August 8th, 1878),—not named, but said to "have some resemblance to *R. adscitus*"—the same? Mr. Briggs is now well acquainted with the proposed *R. Dumnoniensis*, and agrees with me in distinguishing it.

SYNOPSIS OF GENERA AND SPECIES OF *MALVEÆ*.

By Edmund G. Baker, F.L.S.

(Continued from p. 243.)

Malva L.

Sect. 2. *Fasciculatæ* DC. Prod. i. 432.—Bracteolæ 3. Flores in axilla foliorum cymoso-fasciculati aut glomerati. Folia lobata.

* *Bracteolæ ovatæ v. oblongæ.*

5. Malva sylvestris L.; DC. Prod. i. 432; Rchb. Ic. Fl. Germ. v. t. 168; Eng. Bot. ed. 3, t. 281. *M. vulgaris* Ten. Syll. p. 336. *M. recta* Opiz, *fide* Nyman, Consp. p. 129. *M. tomentella* Presl, Fl. Sic. i. p. 174. *M. circinnata* Viv. Fl. Cors. Prod. App. p. 6.—Caule erecto hirto, foliis cordato-orbicularibus 5–7-lobatis,

serratis, pedunculis inæqualiter fasciculatis defloratis erectis, sepalis ovatis acutis hirtis, petalis roseis purpureis striatis calycem multo superantibus, carpellis glabris dorso reticulato-rugoso margine acuto.

Hab. Europe! Siberia! North Africa to India!

Stem 2–3 ft.; leaf-petiole 2–3 in.; lamina 2–3 in. long; bracts ⅕–¼ in.; sepals ¼ in.; petals ⅔–1 in.

β. MAURITIANA Boiss. Fl. Or. i. p. 819. *M. mauritiana* L.; DC. Prod. i. 432; Rchb. Ic. Fl. Germ. v. t. 168. *M. orientalis* Mill. Dict. no. 3. — Caule glabro vel hirsuto, foliis obtusis lobatis, petalis minoribus.

Hab. South Europe! Algeria! India!

γ. ERIOCARPA Boiss. Fl. Or. i. p. 819. *M. erecta* Presl, Delic. Prag. p. 30. *M. polymorpha* Guss. Syn. ii. p. 226. *M. plebeia* Stev. Fl. Taur. p. 92. *M. racemosa* Presl, Delic. Prag. p. 30. *M. hirsuta* Presl, Fl. Sic. i. p. 175. — Caule sæpius hirsuto, carpellis plus minusve tomentosis.

Hab. Italy to Asia Minor! India! Algeria!

δ. AMBIGUA = *M. ambigua* Guss. Prod. Fl. Sic. ii. p. 331. *M. ribifolia* Viv. Fl. Cors. Prod. App. p. 85. — Caule gracile, foliis minoribus superioribus 3–5-lobis lobis lanceolatis acutis, floribus minoribus quam typo.

Hab. Spain! South France! Sicily! Corsica! Algeria!

6. **M. Duriæi,** Hort. Kew. — Caule erecto pubescente, foliis longe petiolatis cordato- vel subcordato-orbicularibus angulatis vel lobatis molliter tomentosis, bracteolis tomentosis, floribus 2–3 axillaribus pedunculatis, sepalis triangularibus acutis accrescentibus pubescentibus, corolla calyce duplove triplo longiore, carpellis dorso planis reticulatis pubescentibus.

Hab. Algeria!

Stem 2–3 ft.; leaves, petiole 2 in. long, lamina 1½ in.; bracts ¼ in.; sepals ⅓ in.; petals ½ in.; peduncles ½–1 in.

Malva Durieui Spach = *Lavatera mauritanica* Durieu. See Linnæa, xxiv. (1851), p. 233.

7. M. NICÆENSIS All.; DC. Prod. i. 433; Rchb. Ic. Fl. Germ. v. t. 168. — Caulibus prostratis vel erectis angulatis, foliis longe petiolatis cordato-orbicularibus 5–7-lobis serratis, stipulis ovatis acutis, sepalis ovatis acutis post anthesin accrescentibus, petalis cœruleis calyce duplo longioribus, carpellis glabris vel hirsutis dorso plano tuberculato margine acuto.

Hab. Mediterranean Region to Persia!

Stem 1–3 ft. long; leaf petiole 2–6 in., lamina 1–2½ in.; bracts ⅕ in.; sepals ¼ in.; petals ⅓ in.

8. **M. subacaulis** Coss. ined. in herb. Kew. — Acaulis vel subacaulis, foliis longe petiolatis cordato-orbicularibus lobatis serratis, bracteolis lanceolatis, sepalis ovatis acutis, corolla calyce duplo longiore, axe carpellorum exserto acuminato striato.

Hab. Marocco; Djebel Ghat, *Cosson*!

Leaf petiole 2–3 in. long, lamina ½ in.; bracts ¼ in.; sepals ⅓ in.; petals ½ in.

** *Bracteolæ lineares vel lineari-lanceolatæ.*

9. M. ROTUNDIFOLIA L. p. p.; DC. Prod. i. p. 432; Rchb. Ic. Fl. Germ. v. t. 167; Eng. Bot. ed. 3, t. 282. *M. neglecta* Wallr. in Syll. Ratisb. (1824), p. 140. *M. vulgaris* Fries, Nov. p. 219; Rchb. Ic. Fl. Germ. v. t. 167. *M. littoralis* Dethard in Rchb. Fl. Germ. iv. 771; Ic. Fl. Germ. v. t. 167. — Multicaulis, caulibus decumbentibus, foliis longe petiolatis cordato-orbicularibus leviter lobatis crenatis, pedunculis defloratis deflexis, sepalis triangularibus vel ovatis acutis, corolla calyce duplo longiore unguibus petalorum barbatis, carpellis pubescentibus dorso rotundatis.

Hab. Europe! North Africa! North and West Asia to India!

Stems 6 in. to 2 ft. long; leaves 1–3 in.; bracts $\frac{1}{6}$–$\frac{1}{5}$ in.; sepals $\frac{1}{4}$ in.; petals $\frac{1}{2}$ in.

Var. RETICULATA Masters in Fl. Brit. Ind. i. p. 320. *M. rotundifolia* var. *a.* W. & A. Prod. i. p. 45. — Corolla calyce longiore, carpellis glabris reticulatis.

Hab. Bengal! North-west Himalayas!

10. M. BOREALIS Wallm. in Liljebl. Sw. Fl. ed. 2, p. 218; Eng. Bot. ed. 3, t. 283; Rchb. Ic. t. 20; Fl. Danica, t. 1825. *M. pusilla* With. Eng. Bot. ed. 3, t. 241. *M. rotundifolia* L. p. p. *M. rotundifolia* Fries, Nov. Fl. Suec. p. 218. *M. parviflora* Huds. Fl. Ang. p. 307, non L. *M. Henningii* Gold. Mosq. p. 133. *M. crenata* Kit. in Sadl. Pest. ed. 2, p. 305. *M. pseudoborealis* Schur, Enum. Pl. Trans. p. 130. *M. rotundifolia* Roxb. Fl. Ind. iii. p. 181. *M. rotundifolia* var. *β.* W. & A. Prod. i. p. 45. *M. rotundifolia* var. *borealis* Masters in Fl. Brit. Ind. i. 320. — Multicaulis, caulibus prostratis adscendentibus, foliis longe petiolatis cordato-orbicularibus lobatis, pedunculis defloratis declinatis, sepalis triangularibus erectis, petalis calyce sublongioribus leviter emarginatis, carpellis glabris vel minute pubescentibus reticulato-rugosis margine acutis integris.

Hab. North Europe! Siberia! India!

Stem 6 in. to 2 ft. long; leaves 1–2 in.; bracts $\frac{1}{5}$ in.; sepals $\frac{1}{4}$ in.; petals $\frac{1}{3}$ in.

Like *M. rotundifolia*, but the leaves are rather less deeply lobed, the petals shorter, and the sculpturing of the carpels different.

11. M. PARVIFLORA L.; DC. Prod. i. 433; Jacq. Hort. Vindob. t. 39. *M. mareotica* Delil. in DC. Prod. i. 433. *M. coronata* Pomel, Nouv. Mat. Fl. Atl. p. 346. *M. simpliciuscula* Steud. in Flora (1856), p. 426. *M. rotundifolia* E. & Z. *M. microcarpa* E. & Z. *M. flexuosa* E. & Z.—Uni- vel multicaulis plus minusve pilosis, foliis longe petiolatis cordato-orbicularibus obsolete 5–7-lobatis, bracteolis brevibus, sepalis accrescentibus erotundatis mucronatis, petalis retusis calyce sublongioribus cœrulescentis ungue glabro, carpellis glabris aut pubescentibus dorso transverse elevato-rugosis margine acuto alato eximie dentato.

Hab. South Europe! Madeira! Marocco! Algeria! Egypt to Afghanistan! and Persia!

Stem 1–2 ft. high; leaves 1–2 in. long; bracts $\frac{1}{5}$ in.; sepals $\frac{1}{4}$ in.; petals $\frac{1}{3}$ in.

β. CRISTATA Boiss. Fl. Or. i. 821. *M. microcarpa* Desf. Cat. Hort. Paris, ed. 1, p. 144; Rchb. Ic. Fl. Germ. v. t. 166.—Carpellorum rugis magis elevatis marginibus in cristulas prominentibus.

Hab. Spain! Italy! South France! Egypt! Babylon!

γ. RIBIFOLIA Lowe, Fl. Madeira, p. 590. — Foliis acute serratis, petiolis pedunculisque longis tenuissimis.

Hab. Madeira. Sta. Cruz!

δ. FLEXUOSA = *M. flexuosa* Horn. Hafn. ii. p. 655. — Foliis cordato-orbicularibus 7-lobatis crenatis, floribus axillaribus subsessilibus.

Hab. Sicily.

12. M. VERTICILLATA L.; DC. Prod. i. 433; Masters in Fl. Brit. Ind. i. p. 320; Eng. Bot. iii. t. 284. *M. neilgherrensis* Wight, Ic. t. 950. *M. alchemillæfolia* Wall. Cat. 1884, *d*. *M. pulchella* Bernh. *M. chinensis* Mill. Dict. no. 6. — Caule erecto ramoso glabro vel pubescente, foliis cordato-suborbicularibus 5–6-lobatis petiolis longis, floribus parvis subsessilibus dense verticillatis, sepalis ovatis acutis accrescentibus, petalis calyce paulo longioribus, carpellis 10–12 dorso et præsertim marginibus transverse rugosis faciebus reticulatis.

Hab. Europe (doubtfully native). Abyssinia! Egypt! India! Amoor Land! China!

Stem 2–4 ft. high; leaves 1–3 in. or occasionally 5 in. long; petiole 5–7 in.; bracts $\frac{1}{4}$ in.; sepals $\frac{1}{3}$ in.; petals $\frac{1}{3}$–$\frac{1}{2}$ in.

M. crispa L., Rchb. Ic. Fl. Germ. v. t. 161, is a cultivated form of this plant.

Var. ABYSSINICA = *M. abyssinica* A. Br. MSS.! *M. physaloides* Hochst.—Foliis præsertim summis acute lobatis.

Hab. Abyssinia!

13. M. OXYLOBA Boiss. Diagn. Ser. 1, viii. p. 109; Fl. Or. i. p. 821. — Glabriuscula, caulibus diffusis, foliis sinu angustissimo cordato-subrotundo- 3–5-fidis vel partitis segmentis obovato-cuneatis in lacinulas lanceolatas acutissimas integras vel trifidas profunde fissis, pedunculis brevibus fructiferis patulis, floribus axillaribus aggregatis, bracteolis setaceis calyce fructifero accreto patenti lobis ovato-triangularibus, petalis truncato-retusis calyce sublongioribus, carpellis glabris transverse et elevatim rugosis reticulatis marginibus elevato-dentatis.

Hab. Palestine! Cyprus!

Sect. 3. *Bibracteolatæ* DC. Prod. i. p. 431.—Bracteolæ 2. Flores axillares solitarii.

14. M. HISPANICA L.; DC. Prod. i. 431; Desf. Fl. Atl. t. 170; Willk. & Lange, Fl. Hisp. iii. p. 573. *M. cuneifolia* Cav.; DC. Prod. i. p. 431.— Uni- vel multicaulis, caulibus ramosis villosis, foliis inferioribus longe petiolatis semiorbicularibus serratis superioribus breviter petiolatis subrhomboideis, bracteolis lanceolatis calyce brevioribus, sepalis triangularibus acuminatis, petalis emarginatis, carpellis glabris dorso rotundatis.

Hab. Spain! Portugal! Algeria!

Stems ½–1 ft.; leaves ½–1½ in. long; bracts ⅓ in.; sepals ½ in.; petals 1 in.

15. M. STIPULACEA Cav.; DC. Prod. i. p. 431; Willk. & Lange, Fl. Hisp. iii. p. 574. *M. hispanica* Asso. Syn. p. 90, nec L., and *M. Tournefortiana* Asso. Enum., non L., *fide* Willk. & Lange, *op. cit.*— Scabra, caulibus declinatis, foliis inferioribus trilobis lobis subemarginatis integerrimis superioribus palmato 3–5-partitis laciniis bi-trifidis, stipulis magnis lanceolato-linearibus, floribus magnis, bracteolis setaceis, sepalis lanceolatis acuminatis, petalis calyce duplo longioribus purpureis.

Hab. Spain (Arragon).

16. M. ÆGYPTIA L.; Jacq. Hort. Vindob. t. 65; DC. Prod. i. p. 431; Boiss. Fl. Or. i. p. 818; Willk. & Lange, Fl. Hisp. iii. p. 574. — Uni- vel multicaulis caulibus erectis vel decumbentibus; pilis ramosis adpressis strigosis, foliis suborbicularibus inferioribus longe petiolatis palmatisectis segmentis tri-multipartitis laciniis lineari-oblongis, pedunculis 1–2 floris folio sublongioribus, bracteolis linearibus, sepalis late triangularibus acuminatis corollam parvam lilaceam subæquantibus, carpellis orbicularibus faciebus radiatim dorso transverse sulcatis.

Hab. Spain! North Africa! Greece! Arabia! Syria! Armenia! to the Caspian Sea!

Stem 1–12 in.; leaves ⅓–½ in. long; bracts ⅕ in.; sepals ⅓ in.; petals ⅓ in.

17. M. TRIFIDA Cav.; DC. Prod. i. p. 431; Willk. & Lange, Fl. Hisp. iii. p. 574. *M. trifida* var. *latifolia* Willk. Sert. p. 32, no. 188. — Uni- vel multicaulis scabris, foliis petiolatis suborbicularibus 3–5-sectis supra glabro subtus hirtulo segmentis foliorum inferiorum trilobis superiorum tripartitis laciniis late linearibus, bracteolis linearibus, sepalis triangularibus acutis, corolla calyce duplo longiore cœrulescente, carpellis faciebus radiatim rugosis dorso tenuiter transverse rugosis.

Hab. Spain!

Stem 4–18 in.; leaves ½ in. long; bracts ⅕–¼ in.; sepals ⅓ in.; petals, ½ in.

β. HETEROPHYLLA Willk. & Costa, in Willk. Pug. p. 92.—Gracilis, minor, foliorum segmentis angustis, carpellis cinereo-olivaceis faciebus non excavatis.

Hab. Spain.

(To be continued.)

SPERGULA PENTANDRA IN IRELAND.

By G. C. Druce, F.L.S.

At pp. 302–303 the Editor kindly reproduces the gist of a paper on *Spergula pentandra* which appeared in another place, and in a much too generous criticism obliges me by pointing out defective citations which I had made. But he writes that I "did not seem to be aware that this [E. B. Plate No. 1536] is reproduced in the 3rd edition of 'English Botany, t. 253, and cited by Syme as *S. arvensis* var. *sativa*, which it undoubtedly represents." If the plate in Syme's Eng. Bot. 253 be consulted (I am assuming that my copy is not an exceptional one), it will be found to be labelled *S. arvensis* var. *vulgaris*, and not as the Editor cites, *S. arvensis* var. *sativa*. In the text, vol. ii., p. 127, of the same work it is also named var. *vulgaris*, and reference there given to the E. B. plate 1536. Syme also adds an important footnote:—"The seeds of the two varieties *a* and *b* have inadvertently been transposed in the two plates," that is, the figures of the seeds in the *vulgaris* plate are figures of the seed of *sativa*, and *vice versa*.

Even this does not altogether conclude the matter, for although it is true that the *outline* of the E. B. plate 1536 is reproduced, and the number is quoted on the plate No. 253 in Syme's E. B., yet the characteristic pubescence very noticeable on the original plate has been apparently intentionally suppressed in the reproduced plate 253, although there are faint traces of hairs in the lower leaves only. So that to me it no longer represents an "undoubted figure of var. *sativa*," while if we follow Syme's directions given in the footnote already quoted and transpose the figures of the seeds, we shall obtain a plate which fairly well represents (although no petals are drawn in detail) the subglabrous state of *S. vulgaris* as it occurs in rich arable soil.

The point raised in my paper might have been more clearly stated. I ventured to claim that the omission of *Spergula pentandra* from the list of British plants is based on an error, namely this, that "the plant found by Sherard in Ireland was one of the species of *Lepigonum*." But we find that the original specimen given by Sherard to Dillenius is true *S. pentandra*, not a *Lepigonum*; that his foreign specimens of *pentandra* collected or obtained by himself and preserved in his own herbarium are not confused with *Lepigonum*, and that the description in the 'Synopsis' is accurate; for these reasons we may assume that Sherard was well acquainted with the plant in question. The statement that he mistook a *Lepigonum* (*Buda*) for it is unsupported by evidence. We know that he visited several parts of Ireland, and plants sent by him from there are again and again mentioned in the 'Synopsis.' An example pertinent to the case of *Spergula pentandra* is that of *Chara polyacantha*, which was collected by Sherard in Ireland. It was figured in Plukenet in 1691, but not for a long time properly identified and admitted to the British Flora. The identification we owe to Messrs. Groves (see Journ. Bot. 1880, 131).

As I have pointed out, the continental distribution of *S. pentandra* is not antagonistic to its occurrence as a native plant in Ireland. My concluding remark would be that the thing to be desired now is its re-discovery in Ireland. This was the reason for writing the note in the 'Annals of Botany,' and for paying a hurried visit to the south of Ireland this year. My search was not rewarded by success, but I have reason to believe that the ground which

I worked was not the part of the country visited by Sherard, which I hope yet to explore.

[The misnaming of E. B. ed. iii. t. 253 was manifestly a clerical error on our part: and a careful comparison of the two impressions of the plate does not lead us to the conclusion that the "apparently intentional suppression" of the pubescence is due to anything but careless printing—of which E. B. ed. iii. furnishes too many examples. We think it better, however, to print Mr. Druce's note as we have received it, agreeing with the writer that "the thing to be desired now is the re-discovery" of *Spergula pentandra* "in Ireland."—Ed. Journ. Bot.]

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.

By James Britten, F.L.S., and G. S. Boulger, F.L.S.

(Continued from p. 314.)

Stewart, Charles (fl. 1791–1811). A.L.S., 1791. Printer. Sec. Nat. Hist. Soc., Edinburgh. Edited Lee's 'Introd. to Botany,' 1811. Jacks. 36.

Stewart, Gilbert A. C. (d. 1876): d. Melrose, 12th Jan. 1876. F.B.S.Ed., 1865. Investigated introduced plants of Gala and Tweed. Trans. Bot. Soc. Ed. xiii. 16.

Stewart, John (d. 1820): d. Edinburgh, 3rd Nov. 1820. Lect. Bot., Edinburgh. Memb. Wern. Soc. Wrote article "Musci" in 'Brewster's Encyclopædia.' 'Hortus Cryptogamicus Edinensis,' 1819. Hook. Fl. Scot. 139. Mem. Wern. Soc. iii. 444. Pritz. ed. 1, 285; Jacks. 252.

Stewart, John Lindsay (1832?–1873): b. Fettercairn, Kincardinesh., 1832?; d. Dalhousie, Lahore, 5th July, 1873; bur. Dalhousie Cemetery. M.D., Edinb., 1856. F.L.S., 1865. Conservator of Forests in Punjab. In India, 1856–1869: returned there, 1872. 'Punjab Plants,' 1869. 'Forest Flora' (commenced by) 1874. Plants at Kew and Edinburgh. Jacks. 609; R. S. C. v. 831; viii. 1017; Journ. Bot. 1873, 319; Proc. Linn. Soc. 1873–4, lvii.; Trans. Bot. Soc. Ed. xii. 31.

Stewart, Neil (1814?–1875): d. Edinburgh, 8th Dec. 1875. A.B.S.Ed., 1850. Botanical draughtsman. 'Colour and Fertilisation,' Trans. Bot. Soc. Ed. xi. 190. Id. xiii. 16.

Stewart, R. B. (fl. 1835). 'Outlines of Botany,' 1835. Pritz. 306; Jacks. 38.

Stewart, Robert (fl. 1860). Of Torquay. M.R.C.S. 'Torquay Flora,' 1860. Jacks. 261.

Stillingfleet, Benjamin (1702–1771): b. Norwich?, 1702; d. London, 15th Dec. 1771; bur. St. James', Piccadilly. B.A., Camb., 1723. 'Tracts,' 1759; ed. 2, 1762; ed. 3, 1775. 'Life and Works,' 1811, with portr. Pult. ii. 349; Pritz. 306; Jacks. 609; Nich. Anecd. ii. 336, 719, with portr.; vii. 399, 682; Nich. Illustr. ix. 103; Cott. Gard. vii. 79, with mezzo. by

V. Green, 1782, after Zoffany; Gent. Mag. 1776, xlvi., 162; xlvii. 440; Biog. Dramatic. *Stillingia* Garden.

Stock, Daniel (fl. 1828–1866). Of Bungay, afterwards of Stoke Newington. Contributed to Mag. Nat. Hist. from 1828. Local Sec., Bot. Soc. Lond., 1839. N. B. G. 112; Top. Bot. ed. 2, 556.

Stocks, John Ellerton (1822–1854): b. Cottingham, Hull, 1822; d. same place, 30th Aug. 1854. M.D., London. F.L.S., 1848. Bombay Medical Staff. Travelled and collected in Scinde, Beluchistan, &c. Pritz. 307; Jacks. 390; R. S. C. v. 836; Gard. Chron. 1854, 580; Gent. Mag. 1854, ii. 401; Proc. Linn. Soc. ii. 46; Journ. Bot. 1854, 308. *Ellertonia* Wight. *Stocksia* Benth.

Stokes, Charles (1783 ?–1853): d. Gray's Inn, London, 28th Dec. 1853. F.R.S., 1821. F.L.S., 1808. Member of Stock Exchange. 'Recent wood petrified,' Trans. Geol. Soc. 1836. Had collection of fossil woods. Jacks. 176; R. S. C. v. 838; Proc. Linn. Soc. ii. 312.

Stokes, Jonathan (1755–1831): b. Chesterfield, 1755; d. Chesterfield, 30th April, 1831. M.D. Of Kidderminster. A.L.S., 1790. Edited Withering, ed. 2, 1787. 'Botanical Materia Medica,' 1812. 'Bot. Commentaries.' Had a herbarium. Pritz. 307; Jacks. 609; Lees' Bot. Worcester, lxxxviii. Portr. Kew.

Stokes, Whitley (fl. 1804). M.D. Of Dublin. Friend of Dawson Turner. Bryologist. Contrib. to Eng. Bot. (1273, 2403, &c.). Muscolog. Hibern. viii. *Hypnum Stokesii* Sm. *Stokesia* L'Her.

Stone, Robert (1751 ?–1829): b. 1751 ?; d. 6th Jan. 1829. Of Bedingham Hall, Bungay. F.L.S., 1790. Contrib. to Withering. Found *Hydnum imbricatum* and *Lycoperdon coliforme.* Had a herbarium. Contrib. to Eng. Bot. (458, 1467, &c.). Smith Lett. i. 43; Mag. Nat. Hist. 1829, 120.

Stonehouse, Rev. M. (or **Walter**) (fl. 1650). Of Darfield, near Barnsley. Correspondent of How. Parkinson, 'Theatr.,' 133, 755. Johnson's 'Itinera' (Wales). Pult. i. 172.

Stonestreet, George (fl. 1695). Brother of following. Collected at the Cape and St. Helena (Mus. Pet. nos. 143, 149); sent Indian plants to Plukenet (Hb. Sloane, 87).

Stonestreet, Rev. William (d. 1716). M.A. Camb., 1681. Rector, St. Stephen, Walbrook, 1689. Correspondent of Petiver (Mus. Pet. nos. 143, 149) and Plukenet (Alm. 68). Sent plants to Buddle, Herb. Sloane, 114. Nich. Illustr. iii. 341.

Storey, John (d. 1859): d. Newcastle, 1859. Sec. Tyneside Nat. Club, 1849–57. Papers in Trans. Tyneside Nat. Club, i.–iii. Sent list Newcastle pl. to Watson, Top. Bot. ed. 2, 557. Was preparing Flora of Northumberland and Durham.

Stowell, Rev. Hugh Ashworth (1830 ?–1886): b. Pendleton, Lanc., 1830 ?; d. Breadsall, Derby ?, 16th March, 1886. B.A., Oxon. 1852. M.A., 1855. Rector of Breadsall, 1865. 'Fl. of Faversham,' Phytol. i. (1855–56), 249, 375; ii. (1857–58), 100, 153, 180. R. S. C. v. 846.

Strange, John (1732–1799): b. 1732; d. Ridge, Middlesex, 19th

March, 1799. M.A., Camb., 1775. F.R.S. LL.D. D.C.L., Oxon, 1793. Brit. Resident at Venice, 1773–88. 'Lettera sopra Conferva Plinii,' Pisa, 1764. 'On the Origin of a Natural Paper,' Phil. Trans. lix. (1769), 50. Pritz. 307; Nich. Anecd. viii. 10; Allibone.

Streeten, Robert James Nicholl (1800–1849): b. London, 28th June, 1800; d. Worcester, 10th May, 1849. Practised at Worcester. M.D., Edinb., 1824. F.L.S., 1846. Contrib. to Phyt. i. 236; ii. 405. 'Myosotis,' Naturalist, i. 171 (1837). Proc. Linn. Soc. ii. 48; R. S. C. v. 853.

Strickland, Agnes (1806–1874): b. Roydon Hall, Suffolk, 1806: d. Roydon Hall, 8th July, 1874. Historian. 'Floral Sketches,' 1836. Pritz. 307; Jacks. 212; 'Life,' by J. M. Strickland, with portr., 1887.

Strickland, Catherine Parr [*See* TRAILL].

Strickland, Freeman [*See* FREEMAN, CHARLOTTE].

Strickland, Hugh Edwin (1811–1853): b. Righton, E. Yorksh., 2nd March, 1811; killed Clarboro', near Gainsboro', 14th Sept. 1853. B.A., Oxon, 1832. M.A., 1835. F.R.S., 1852. Geologist and zoologist. 'Natural System in Zoology and Bot.,' Mag. Zool. Bot. vi. (1841), 184. 'Report on Vitality of Seeds' (with Daubeny, Henslow, and Lindley), Brit. Assoc. Rep. 1845. Jacks. 95; R. S. C. v. 855; 'Memoirs,' by Sir W. Jardine, 1858; 'Athenæum,' 1853, p. 1125; Allibone; Gent. Mag. 1853, ii. 420.

Stroud, T. B. (fl. 1821). Landscape gardener. Of Greenwich. 'Elements of Bot.,' 1821. Pritz. 308; Jacks. 37.

Strutt, Jacob George (fl. 1814–52). Landscape painter and etcher. Exhibited at R.A., 1822–52. At Lausanne and Rome, 1830–51. 'Sylva Britannica,' 1822; ed. 2, 1831–36. Pritz. 308; Jacks. 245; R. S. C. v. 865; Bryan.

Stuart, John, 3rd Earl of Bute (1713–1792): b. Scotland, 1713; d. London, 10th March, 1792. 'Tabular Distribution of Brit. Pl.,' 1780. 'Botanical Tables,' 1785. Jacks. 34; Linn. Letters, i. 26; Rich. Corr. 407; Baillon, i. 530; Encyc. Brit. iv. 581; Rose. Mezzo. by R. Purcell, 1763, after A. Ramsay. *Stewartia* L. *Butea* Roxb.

Stuart, Rev. John (fl. 1777–1805): d. before 1832. Minister of Killin, Breadalbane, and afterwards of Luss, Dumbarton. D.D. A.L.S., 1793. Travelled in Highlands and Hebrides with Lightfoot, and assisted him in 'Flora Scotica.' "Has the finest private garden, and is the best botanist in Scotland," Memoir of Dr. Wright, 1828, 146. Discovered *Juncus biglumis*. Contrib. to Eng. Bot. (898, 2586). Fl. Scotica, xii. *Salix Stuartiana* Sm.

Sturrock, Abraham (1843–1886): b. Padanarum, Forfar, Sept. 1843; d. Rattray, Perthshire, 13th March, 1886. Schoolmaster. Studied water-plants. Herbarium in Perthsh. Soc. Nat. Science Museum. Scott. Nat. 1886, 298. *Potamogeton pusillus* var. *Sturrockii* A. Benn.

Sturt, Charles (1796–1869): b. India, 1796: d. Cheltenham, 16th June, 1869. F.L.S., 1833. Captain, 39th Regt. Traveller.

Friend of R. Brown. In S. Australia, 1828–31, in Central Australia, 1844–46. 'Expeditions into S. Australia,' 1833. 'Expedition into Central Australia,' 1849, bot. appendix by R. Brown, to whom Sturt sent his plants. R. S. C. v. 880; Proc. Geogr. Soc. xiv. 287. *Sturtia* Br. = *Gossypium Sturtii* Muell.

Sutherland, James (fl. 1684–1703). Intendant of Bot. Gard., Edinb. 'Hortus Medicus Edinburgensis,' 1683. 'Cat. Pl. Hort. Edinb.,' 1684. Correspondent of Petiver, Sherard, Uvedale, &c. Sent Scottish plants to Petiver, Mus. Pet. 70, 95. Pult. ii. 4; Pritz. 309; Jacks. 411; Rich. Corr. 27, 69; Loudon, 'Arboretum,' 50; Pref. to Newton's Herbal, p. 5. *Sutherlandia* Br.

Sutherland, Peter C. (fl. 1850–1870). M.D. Surveyor-General, Natal. Sent plants to Harvey. 'Journ. of Voyage in 1850–51 in search of 'Erebus' and 'Terror,'' 1852. Fl. Capensis, i. 9.* R. S. C. v. 889; viii. 1047. *Greyia Sutherlandi* Harv.

Sutton, Rev. Charles (1756–1846): b. Norwich, 6th March, 1756; d. Tombland, Norwich, 28th May, 1846. B.A., Camb., 1779. D.D., 1806. A.L.S., 1791. Pupil of John Pitchford. 'British species of *Orobanche*' (discovered *O. elatior*), Trans. Linn. Soc. iv. 173. Contrib. to Eng. Bot. 20, 568, &c. R.S.C. v. 889; Proc. Linn. Soc. i. 341. *Suttonia* A. Rich.

Sutton, George (1774–1859): b, England, 1774; d. Bathurst, N. S. Wales, May, 1859. Sent by Banks to N. S. Wales, 1798; returned to England, 1842, and shortly again to N. S. Wales. F.L.S., 1843. 'Culture of Grape-Vine and Orange in Australia,' 1843. 'Forest-trees of Australia.' R. S. C. v. 890; Proc. Linn. Soc. i. 177; 1859–60, xxxiii.

Swainson, Isaac (d. 1806). Had a private bot. garden at Twickenham, circ. 1789, and owned some vegetable medicines. Loudon, 'Arboretum,' 75, 2533. *Swainsona* Salisb.

Swainson, William (1789–1855): b. Liverpool, 8th Oct. 1789; d. Fern Grove, New Zealand, 7th Dec. 1855. Zoologist. F.R.S., 1820. F.L.S., 1816. 'Instructions for Collecting,' 1808. 'Naturalist's Guide,' 1822. Studied *Iris*, Sweet, Flower Garden, 2nd Series, iii. 254. 'Botanical Report on Victoria,' 1853. Greek plants in Herb. Liverpool Bot. Gard. Pritz. 309; Jacks. 218; R. S. C. viii. 893; Proc. Linn. Soc. 1855-6, xlix.; Naturalist, iv. 397 (1839). Water-colour portr., by Harrison, at Kew.

Swayne, Rev. George (1746?–1827): b. Evilton, Somerset, 1746?; d. Dyrham, Gloucester?, 24th Oct. 1827. B.A., Oxon, 1766. M.A., 1771. Vicar of Pucklechurch, Gloucestersh., 1772. Rector of Dyrham, 1806. 'Gramina pascua,' 1790 (with dried specimens). Jacks. 239; R. S. C. v. 897.

Sweet, Robert (1783–1835): b. Cockington, S. Devon, 1783; d. Chelsea, 20th Jan. 1835. Nurseryman. F.L.S., 1812. Had a nursery at Stockwell, 1810, and afterwards at Parson's Green. 'Geraniaceæ,' 1820–30. 'Cistineæ,' 1825–30. 'Hortus Britannicus,' 1826. 'Flora Australasica,' 1827. 'British Flower-Garden,' 1822–31. 'Botany of Great Britain,' 1831. Contrib. to Mag. Nat. Hist. ii. & iii. Pritz. 310; Jacks. 610; Mag. Nat. Hist. viii. 410; Gard. Mag. xi. 159, w. bibliography. *Sweetia* DC.

Swete, Edward Horace (fl. 1854). Surgeon. Of Clifton, Bristol. Lect. Bot., Bristol Med. School. 'Flora Bristoliensis,' 1854. Pritz. 310; Jacks. 249.

(To be continued.)

SHORT NOTES.

Drosera anglica in Hants.—Captain A. Steuart, of Ventnor, has called my attention to the fact that Mr. Townsend, in his 'Flora,' considers the occurrence of *Drosera anglica* doubtful in Hants. In Watson's Top. Bot., p. 60, the record for Hants South is also queried. I have found this plant on several occasions in the New Forest, and forward a voucher-specimen for the British Museum Herbarium. My first observation of it was in 1884, when in company with Mr. A. E. Gibbs. It occurs in fair quantity in the wettest part of the bog a short distance S.W. from Holmsley Station, being most abundant in an open swampy spot amongst the alders. It is associated with *D. intermedia* and *D. rotundifolia*, as well as *Carex limosa*. I do not feel much hesitation in thus specifying the locality, as it would require considerable enthusiasm or cupidity to induce anyone to wade through the morass to the exact spot. During the month of August of the present year I observed the plant in the same station in fair abundance, and also one plant in another bog in the New Forest.—J. Saunders.

Bedfordshire and its Droseras. — In Watson's Top. Bot., pp. 59, 60, *Drosera rotundifolia*, *D. intermedia*, and *D. anglica* are all recorded for Beds. With reference to the latter two, the records should be accepted with considerable reserve. In Journ. Bot. 1881, p. 44, Mr. Pryor, in his 'Notes on the Herbarium of Abbot,' says:—"*Drosera longifolia*, no specimen. *D. anglica*, correctly named." On reference to Abbot's 'Flora Bedfordiensis,' it appears that both these species, as well as *D. rotundifolia*, are given for either "Ampthill" or "Ampthill Bogs," and for no other station. Assuming that by *D. longifolia* is intended *D. intermedia* Hayne, I am fully persuaded that both this and *D. anglica* have been extinct in the locality for forty or fifty years. From about 1840 to 1846 the district in question was carefully worked both by the Rev. Mr. Crouch and Mr. J. M'Laren, neither of whom succeeded in finding any other sundew than *D. rotundifolia*. For the last ten years Mr. C. Crouch and myself have made a minute examination of the bogs near Ampthill and Flitwick, and no specimen of either species has rewarded our efforts. The only species now to be found in Bedfordshire is *D. rotundifolia*, and this but in limited quantities in two small areas.—J. Saunders.

Malva borealis in Kent. — During September last I found *Malva borealis* Wallm. plentifully at Kingsdown, near Deal. Associated with it was *Setaria viridis* and *Hyoscyamus niger*. I have since found *M. borealis* at Edenbridge, in West Kent; and *Cnicus arvensis*, c. *setosus* Bess. in waste ground at Four Elms, near

Edenbridge. The specimens have all been identified by Mr. N. E. Brown, of Kew.—Ernest S. Salmon.

Carex montana Linn. in N. Somerset.—I was having a day's botanising last July with the Rev. R. P. Murray in the Mendip Hills, when I had the good fortune to detect the leaves of *Carex montana* L. among the grass on a gently sloping bank by a roadside. Careful search led to the discovery of a few withering spikes, very few in proportion to the number of its plants, and on one of these a single fruit remained. It was late in the season for this early flowering *Carex*, and this may account for our not finding the remains of a larger number of spikes. Mr. Murray, who has been collecting material for the forthcoming 'Flora of Somerset,' has since informed me that this is an addition to the county list.—Edward F. Linton.

Rubus silvaticus W. & N.—I have to correct two errors in the names of the stations of *Rubus silvaticus* in my article on this bramble at p. 276. The S. Wilts station should be Landford, as it is correctly written in Herb. Rev. W. Moyle Rogers, and not Landport; the Salop station Longmynd, not Longwynd, Hill, this latter mistake being the result of a typographical error overlooked in the correction of the proof.—T. R. Archer Briggs.

Rosa micrantha Sm., var. Briggsii Baker. — My attention has been directed to the statement in the last issued "List of Desiderata" of the Botanical Exchange Club to the effect that "*Rosa micrantha* Sm. var. *Briggsii*" is synonymous with "*Rosa agrestis* Savi." This is certainly not the case, for the Devon plant is clearly a variety of *Rosa micrantha*, as stated in my 'Flora of Plymouth.' It differs from the typical plant only by having perfectly glabrous peduncles, and sepals eglandular at the back. It so happened that the varietal name of *Briggsii* was first given to specimens of a luxuriant form of this variety by Mr. J. G. Baker in his Mon. Brit. Roses (Journ. Linn. Soc. xi. 222).—T. R. Archer Briggs.

Welsh Records. — I have been again in N. Wales, at Beddgelert, this autumn, and met with the following plants not included in Top. Bot. ed. 2:—48. Merionethshire, *Lysimachia Nummularia* and *Sparganium simplex;* ditches east of the Glaslyn below Aberglaslyn Bridge. 49. Carnarvonshire, *Carex remota;* on the old road by Gwynant Lake, leading to Pennygwryd.—F. C. S. Roper.

NOTICES OF BOOKS.

The British Moss-Flora. By R. Braithwaite, M.D., F.L.S. Part XIII. Fam. XII. Splachnaceæ; XIII. Œdipodiaceæ; XIV. Funariaceæ; XV. Bryaceæ, i. (The Author, 303, Clapham Road). 6s.

This standard work, which has been published at the average rate of one part yearly, is advanced another stage by the appearance of part xiii. It consists of 56 pages of letterpress, and

6 plates containing illustrations of 26 species; and treats of 14 genera. Upon comparing it with Wilson's 'Bryologia Britannica,' we find a new genus and a new species added to the British Flora. The new genus is *Nanomitrium* Lindb., of the four species of which one only is found in Britain, *N. tenerum* Lindb. (*Phascum* Bruch). This species is remarkable for having been found twice only,—at Niesky in Silesia, by Breutel, some sixty years ago, and at Hurstpierpoint, by Mitten, in 1854. The new species is *Funaria microstoma* Br. et Sch., occurring in Sussex and Hampshire.

Entosthodon is united with *Funaria*, and constitutes a section of that genus. *Funaria calcarea* Wahlenb. includes *F. hibernica* Hook. as a synonym, and under it is given an account of the confused synonymy of *F. Muehlenbergii* and of Lindberg's attempt to put an end to it by re-naming the species.

Mielichhoferia nitida Hornsch. and *Orthodontium gracile* Schwaegr. appear respectively as *Oreas Mielichhoferi* Brid. and *Stableria gracilis* Lindb. The genus of *Bryaceæ* which is commonly known as *Webera* must be looked for under *Pohlia*, the author having already employed the name *Webera* for *Diphyscium* in part x.

It is to be regretted that a work of such costliness and beauty is not more carefully revised, *e. g.*, on p. 110, at the end of the list of works quoted in reference to *Splachnum sphæricum*, after "Juratz." should be supplied the words "Laubm. œster.-ung. 234 (1882)." Hampe's genus, which "Mr. Mitten unites with *Mielichhoferia*," is not *Haplomitrium*, which is a genus of Hepatics, but *Haplodontium*. *Leptobryum tenuinerve* is not one of Spruce's species, as one might be led to suppose by the text, but is No. 252 of Spruce's 'Musci Amazonici et Andini,' called by Lindberg (?) *Leptobryum tenuinerve*. (There is in the Herbarium of the British Museum a specimen of this moss, received from Lindberg and named *Leptobryum angustinerve* Lindb.) "*L. robustum* from Australia" is also one of Lindberg's species. These, however, are but trifling errors, and do not detract from the value of Dr. Braithwaite's work.

The name *Leptobryum* gives rise to an interesting speculation as to who was the real authority for that name, and for the combination *Leptobryum pyriforme*. Lindberg and British authors, including Dr. Braithwaite, make Wilson the authority; continental authors accept Schimper. The names first appeared in the year 1855,—in Wilson's 'Bryologia Britannica,' p. 219, and in Schimper's 'Corollarium Bryologiæ Europææ,' p. 64. Wilson does not quote the author's name, which would lead one to believe that he originated the genus. Schimper, on the other hand, quotes himself as the author in the 'Synopsis Muscorum Europæorum,' pp. 328, 329 (1860), and retains the claim in edition ii. pp. 389, 390 (1876). The questions to be settled are two:—(1), whether Wilson's 'Bryologia' preceded Schimper's 'Corollarium,' or *vice versâ*; and (2), whether Schimper invented the name and communicated it in MS. to Wilson, and the latter introduced it into his book without acknowledging its source.

A. G.

ARTICLES IN JOURNALS.

Bot. Centralblatt (Nos. 40, 41).— —. Overton, 'Histologie & Physiologie der Characeen.' — (Nos. 41–43).—K. Mischke, 'Ueber das Dickenwachsthum der Coniferen.'—(Nos. 42, 43). W. Migula, '*Gonium pectorale*' (1 plate).

Botanical Gazette (Sept. 15). — C. Warnstorf, 'N. American Sphagna.'

Bot. Zeitung (Sept. 12 –Oct. 10). — J. Wortmann, 'Ueber den Nachweis, das Vorkommen und die Bedeutung des diastatichen Enzyms in den Pflanzen.'— (Sept. 19). A. Koch, 'Zur Kenntniss der Fäden in den Wurzelknöllchen der Leguminosen.' — (Oct. 17). A. Fischer, 'Ueber den Einfluss der Schwerkraft auf die Schlafbewegungen der Blätter.'

Bull. Torrey Bot. Club (Oct.). — E. L. Gregory, 'Manner of growth of Cell-wall' (1 plate).—J. W. Eckfeldt, 'Lichens of United States.'—L. M. Underwood, '*Lejeunia Macounii* Spruce, sp. n.'

Gardeners' Chronicle (Oct. 4). — *Sobralia Lowii* Rolfe and *S. Wilsoniana* Rolfe, spp. nn.—(Oct. 11). *Barbacenia squamata* (fig. 81). W. G. Smith, *Cladosporium orchidearum* (fig. 82). — (Oct. 18). *Hæmanthus Lindeni* N. E. Br., n. sp. (fig. 85). — (Oct. 27). *Pinus Montezumæ* (figs. 91–94).—*Angræcum Henriquesianum* Rolfe, n. sp.

Journal de Botanique (Aug. 16).— C. Sauvageau, 'Sur la feuille des Hydrocharidées marines.'— —. Hue, 'Lichens de Canisy.'—(Sept. 1 & 16). A. Franchet, 'Plantes nouvelles du nord de la Chine.' — G. Poirault, 'Les Urédinées et leurs plantes nouricières.' C. Sauvageau, 'Structure de la feuille des genres *Halodule* et *Phyllospadix*.' — (Oct. 1). H. Feer, 'Recherches litteraires et synonymiques sur quelques Campanules.'

Notarisia (dated Aug. 31: received Oct. 29). — M. Mobius, 'Algæ brasilienses a cl. Glaziou collectæ' (1 plate).—E. De Wildeman, 'Sur la dispersion de *Cephaleuros virescens* et *Phycopeltis arundinacea*.' — D. Levi Morenos, 'Sur l'évolution défensive de Diatomées en rapport avec la Diatomophagie des animaux aquatiques.'

Oesterr. Bot. Zeitschrift (Oct.).—A. v. Kerner, 'Die Bildung von Ablegern bei *Sempervivum & Sedum dasyphyllum*.'— R. v. Wettstein, 'Das Vorkommen der *Picea Omorica* in Bosnien.' — H. Zahn, '*Carex flava, Oederi, & Hornschuchiana* und deren Bastarde.'— C. Baenitz, '*Cerastium Blyttii* Baenitz.'—J. Freyn, 'Flora von Oesterreich-Ungarn.' — J. Wiesner, 'Versuch einer Erklärung des Wachsthums der Pflanzenzelle.'

Scottish Naturalist (Oct.). — F. B. White, Willows of North-east Scotland.—J. W. H. Trail, '*Uredineæ* and *Ustilagineæ* of Scotland.' Id., 'Additions to list of Scotch *Discomycetes*.'

THE LATE JAMES BACKHOUSE.

(With ~~Portrait.~~)

By the death of James Backhouse on the 31st August last at his residence, West Bank, York, English Botany has lost one of its most painstaking observers and accurate exponents. Born in York on the 22nd of October, 1825, he was educated at the Friends' School in Lawrence Street (since transferred to 20, Bootham, York), and from a young man inherited the taste for Natural History so strongly developed in his father. The latter, who bore the same name, was widely known as a prominent Minister of the Society of Friends, and for his long and important missionary journeys in the Southern Hemisphere in connection with that body. Here during his mission labours he collected many plants, especially from among the numerous and beautiful group of Filmy Ferns; these he transmitted to his nurseries in York, where they have ever since been cultivated with singular success. These nurseries, the most important in the north of England, have been in existence for over a century. Eighty years ago they were in the hands of the Telford family, who had conducted them for several generations in "The Friars' Gardens," but who subsequently yielded them up in favour of the (to them) more profitable occupation of whale fishery. They were then purchased by Thomas and James Backhouse, of Darlington, who, on the introduction of railways, removed them to Fishergate, and later still to their present site between Holgate and Acomb.

For many years father and son followed their favourite pursuit, together exploring many of the more remote mountainous districts in the north of England, Scotland, and Wales. On the 20th of January, 1869, James Backhouse, sen., died. An interesting account of his life by Mr. J. G. Baker appeared in this Journal for that year. During a long period, therefore, it was impossible to separate the botanical work of the two James Backhouses. Their joint labour in the exploration of the remarkable flora of Teesdale is known to all English botanists. A paper in the handwriting of the late Mr. Backhouse has been placed in my hands, which gives in a rough chronological order the dates of their journeys either alone or together, and the more important botanical discoveries which they made. Though too long to quote at length, it is of sufficient interest to justify me in inserting the following brief summary.

The paper begins with a reference to a visit by James Backhouse, sen., to Castle Eden Dene in 1803, where he found *Cypripedium Calceolus* L. From this date to the year 1842 all the notes refer exclusively to his work, chiefly in Teesdale, which he first visited in 1810. The more noteworthy plants there found by him were *Helianthemum marifolium* Mill, var. *vineale* Pers., *Arenaria verna* L., *Dryas octopetala* L., *Potentilla fruticosa* L., *Saxifraga Hirculus* L. (Bauldersdale), *Sedum villosum* L., *Epilobium alsinifolium* Vill., *Gentiana verna* L., and *Woodsia ilvensis* R. Br., which he first found in 1821. From 1843 to 1865 the two Backhouses worked together. In the former year they discovered Highcup Scar, where *Saxifraga nivalis* L. was found; and in the same year *Veronica triphyllos* L. near Acomb, York, and *Barbarea stricta* Andrz. on Thorne Moor. In 1845 they went to Scotland, and on the 24th of July first found *Hieracium chrysanthum* Backh. and *Athyrium flexile* Syme in Glen Prosen. The summer of 1847 was devoted to Cumberland, where they discovered *Saxifraga Hirculus* L. at Knock-ore-Gill, and *Hieracium holosericeum* Backh. on Glaramara. During a visit to the Spital of Glen Shee in 1848 they found *Sagina nivalis* Fr. on Glas Mhiel, and *Gnaphalium norvegicum* Gunn., *Gentiana nivalis* L., *Veronica saxatilis* L., and *Juncus castaneus* Sm. in Canlochen Glen. Here a crag adventure is alluded to, but no details are given. The summers of 1849 and 1850 were devoted to the Clova and Braemar districts; it is unnecessary here to give a long list of the now well-known rarities that they found in these regions, except to quote the note, "*Poa minor* first?" Norway was the subject of their explorations in 1851, where Mr. Backhouse painted a most remarkable picture showing the effects among the mountains of a total eclipse of the sun. The picture was completed from notes made on the spot, and is of great interest. The spring of 1852 again found them in Teesdale, where on the 25th of May they discovered *Myosotis alpestris* Schmidt for the first time in England. Their summer holiday was devoted to the exploration of Forfarshire and Aberdeenshire, and great *Hieracium* hunts in both the Clova and Cairngorm Mountains are especially alluded to. Among the more noteworthy plants mentioned are *Cystopteris alpina* Desv. var. *Dickieana* Milde, *Poa laxa* Haenke and *P. stricta* Lindb., *Drosera anglica* Huds., b. *obovata* M. & K., *Arabis petræa rosea*, and *Lactuca alpina* Bentham. In 1853, Gordale and Giggleswick Scars, near Settle, were explored, but no note is made as to what plants were found.

Of a visit to Ireland in 1854 there are no particulars given beyond the record of their finding *Hieracium iricum* Fr. at Letterfrack. *Cystopteris montana* Bernh. was discovered in Canlochen Glen in 1855, and *Ajuga pyramidalis* L. was gathered in Sutherland in 1856. *Saxifraga Sternbergii* Willd. was found in Cumberland in 1857. *Woodsia* was collected on Craig Chaillach and the Killin Mountains in 1859, and reference is made to a "crag adventure with father and Thomas Westcombe." The Breadalbane Hills were again visited in 1861, when special mention is made of the occurrence of *Cystopteris montana* Bernh. on Mael Ghyrdy. Another exploration of Teesdale in the spring of 1862 revealed *Viola arenaria* DC. as a British plant, and the blue variety of *Polygala amara* Jacq. var. *uliginosa* Fr. In 1863 *Saxifraga cæspitosa* L. was gathered on Twl Ddu, in North Wales, and a great hunt made for *Trichomanes radicans* Sw. *Asplenium lanceolatum* Huds. was found at Portmadoc. James Backhouse, sen., made his last excursion to Wales in May, 1865, when *Lloydia* was gathered in flower on the crags of Ys Golion Duon, and "*Cineraria maritima*" (*Senecio spathulifolius* DC.) at Holyhead. In 1866, *Teesdalia nudicaulis* R. Br., *Lychnis alpina* L., and *Aquilegia* were gathered in Cumberland. In 1869, *Trichomanes radicans* Sw. was gathered in Wales, and *Ajuga pyramidalis* L., *Potentilla fruticosa* L., and *Dryas octopetala* L., "all in the Lake District." Wales was again visited in 1871, when "two fresh patches of *Trichomanes* in . . . . station with T. Westcombe and Theodore" were found. Beyond 1871 this interesting record does not go, but no one can glance through the brief *résumé* here given without realizing the extent and importance of the work accomplished for British field botany by the two Backhouses. In the numerous papers he wrote for the 'Phytologist'* and 'Botanical Gazette,' vol. iii. p. 43, will be found graphic and interesting details concerning many of the above noteworthy discoveries.

His knowledge of Scotland was so profound that on one occasion, when a prominent Scottish botanist was asked by a fellow-student whom he considered to have the best knowledge of Scotland botanically, he unhesitatingly named Mr. Backhouse. In North Wales, too, so careful was his search for the Killarney Fern that over many miles of country his knowledge extended to every stream.

Mr. Backhouse's chief reputation as a botanist, however, will rest on his well-known 'Monograph of the British Hieracia,' published in 1856. Until that time but little attention had been given to this critical genus. Those only who have made a special study of such a genus can appreciate the difficulty of collecting, separating, and reducing to systematic order a mass of material of which so little was previously known. This book is a monument to the honest, accurate, and painstaking work of its author, no less than to his keen powers of perception, and ability to describe what he saw. There are here described no less than twelve new species, all of which have borne the test of severe criticism, and are now accorded a permanent place in our Flora.

Although able to take long walks in the mountains, Mr. Backhouse was always more or less of an invalid. For this reason he visited little, and was personally known to but few botanists, though greatly beloved by all who had the privilege of his acquaintance. He showed at all times the keenest possible interest in his favourite studies, on which he conversed with great vivacity. Extreme accuracy characterized all his work, and the writer will never forget the minute directions he was able to give to insure the finding of some of his favourite plants, many of which he was in the habit of visiting year after year to assure himself that they had not fallen a prey to the greedy collector.

Botany, however, was by no means Mr. Backhouse's sole interest. The beautiful private museum attached to his house testifies to his varied tastes and knowledge. The fine geological collections from the caves he discovered and explored year after year in Upper Teesdale, together with the antiquarian objects of interest from all parts of the world, will well repay a visit.

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* 'Phytologist,' 1846, pp. 422 and 579; 1847. p. 1044; 1849, pp. 441, 475, 544; 1850, p. 768; 1852, p. 606; 1853, p. 804; 1861, p. 303; 1862, p. 30.

It was not until late in life that he joined the Linnean Society, of which he was elected Fellow on the 7th of May, 1885.

To sketch the life of James Backhouse, however briefly, without mentioning his work in the development of the gardens at York would be to ignore one of its chief features. The marvellous imitation of an alpine glen in his private garden, with its miniature lake and waterfall, crags and bogs, is a delight to the thousands who visit it. His excellent knowledge of geology, and quick perception of what was essential in the natural surroundings of the various alpine plants made him a world-wide reputation as one of their most successful cultivators. It is outside the scope of this short paper to give any detailed account of the nurseries, covering about a hundred acres, which have undergone such a wonderful development of late years. There are some forty houses, mostly large, and of modern design. The underground ferneries, with their unparalleled collection of Hymenophyllums, Trichomanes, and Todeas, charm all who see them. An excellent description of these nurseries appeared only a few days before Mr. Backhouse's death in an American paper, 'Garden and Forest,' for August 20th, 1890, and is well worthy the perusal of all those interested in horticultural subjects.

In politics Mr. Backhouse was a Liberal, and took special interest in the causes of temperance and international peace. A pamphlet from his pen, 'Is war lawful for the Christian?' has had a considerable circulation. Though in failing health for many years, his comparatively early death was greatly hastened by striking his head through a fall on some ice near his own gate. Whilst better at times, he never really recovered from this accident, and for the last year and a half was unable to continue his correspondence with the writer on his favourite plants. He leaves a widow, a daughter, and a son, James Backhouse, who now carries on the business, and has already made his mark as an ornithologist.

The 'Yorkshire Daily Chronicle' thus concludes a brief notice written the day after his death:—"The city of York has lost a citizen of accurate scientific knowledge, and a man of Christian character, whose cultured mind, poetic and artistic tastes, combined with remarkably simple and unassuming manners, had endeared him to many who will long cherish his memory."

Frederick J. Hanbury.

HEPATICÆ OF LOUGHBRAY, CO. WICKLOW.

By David McArdle.

Loughbray is twelve miles south by west from Dublin on the north-east side of Kippure Mountain. Although the name is generally used in the singular number, there are two small lakes called Upper and Lower; the smaller or upper lake is at an elevation of 1453 ft. above sea-level and 228 ft. higher than the lower one. Both are interesting to the geologist, affording a remarkable instance of a glacial moraine dam; and enormous boulder stones of granite, many tons in weight, lie scattered about, and give evidence of former existence of the ice-force as it descended from the mountains to the sea.

It is the exposed part of the mountain which borders the upper lake for upwards of two miles that presents to the hepaticist such a rich field for investigation (only equalled for its size by Killarney), which forms the subject of this notice. It has been the favourite resort of many bryologists. Taylor, in 'Flora Hibernica,' mentions five species of liverworts from this locality. The late lamented Dr. Moore frequently collected cryptogams here, and in 1873, with the late Professor Lindberg, paid it a searching visit, with the result, amongst others, of a very small quantity of the rare *Nardia sphacelata* being collected by Lindberg, which had not previously been detected in Ireland, and which he included in his 'Hepaticæ in Hibernia mense, Julii 1873, lectæ,' wherein he states that Dr. Moore had collected it there in 1869. We have no doubt that it lurks amongst his specimens of *Nardia emarginata* and *N. compressa*, collected by him in that year, a portion of which he sent to Professor Lindberg. My own collecting of liverworts and mosses in this locality extends over some years, often with Dr. Moore, and other able bryologists. In July, 1887, when collecting there with Mr. F. W. Moore, he gathered a plant which I had no difficulty in referring to *Nardia sphacelata*, and it is interesting to note that it should fall to the lot of Dr. Moore's son to verify the station for this rare plant. Later in the season, Mr. Scully and I returned to the place where he stated it was growing, and gathered it in abundance and in fruit, associated with *Nardia compressa* and *N. emarginata*. They quite carpetted a large rock over which the water more or less trickles, and in winter time would form part of the bed of a mountain stream. We distributed a portion of it to good authorities, who stated that they had not seen it in a fertile state before, owing probably to its diœcious habit. Its geographical distribution is northwards through Scotland, Greenland, Finland, and Switzerland; it is also reported from America, on the Catskill Mountains, New York (Dr. P. Cleve), and on the Alleghanies (Sullivant).

It will be obvious from the appended list that most of the plants collected at Upper Loughbray are of a Scandinavian type. I therefore sent all those which there could be any possible doubt about to Mr. Errick Nyman, of Linkoping, Sweden, an accomplished student of the late Prof. Lindberg, who had the assistance of Messrs. Kaurin and Kaalaas, two excellent Scandinavian and Norwegian bryologists, to all of whom I tender my grateful thanks.

Amongst my specimens of *Cephalozia* a small quantity of *C. leucantha* Spruce was detected, but I have failed to find any more in the same packet; and a second portion, which I sent to Dr. Spruce, only gave very young slender shoots of *C. bicuspidata*, which may possibly have been mistaken for it. It has been gathered in Scotland, and it will be interesting for some energetic collector to verify the station, as in the case of *Nardia sphacelata*.

Dr. Spruce says the true plant has very small leaves, minute cells, and for its size enormously long slender perianths.

In the following list, which is provisional only, I have enumerated 67 species, forming a large percentage of the whole 146 species known to inhabit Ireland, all collected within the distance of two miles. Six of these are new to the county of Wicklow; they are *Frullania fragilifolia*, *Mylius anomalus*, *Jungermania* (*Lophozia*) *exsecta*, *J. intermedia*, *J. incisa*, and *J. porphyroleuca*. Loughbray is a new locality for the following four:—*Cephalozia curvifolia*, *Kantia arguta*, *J.* (*Aplozia*) *crenulata*, *and Jungermania nana.*

Marchantia polymorpha L. Plentiful on moist banks (seldom found fertile).

Conocephalus cornicus Neck. Abundant in damp shaded places, on the banks of streams forming large masses, fruiting in spring.

Frullania dilatata Dumort. Plentiful on the trunks of trees and on wet rocks. — *F. fragilifolia* Tayl. On the trunks of Alder, and also firmly attached to the wet rocks, and amongst *Plagiothecium elegans*, D. McA., July, 1887. Leaves of a dull purple colour, very convex, and from their narrow insertion readily detached on pressure; auricles oblong, helmet-like; under leaves (stipules) ovate and bifid at the apex; margin plane.—*F. Tamarisci* Dumort. Plentiful on the smooth bark of trees, spreading in large patches.—Var. *robusta* (♂ ster.), S. O. Lindberg, 1873. — *F. germana* Tayl. On moist rocks and on the trunks of moss-covered trees; plentiful. Often passed over for the preceding, from which it differs in its large size, light brown colour, involucral bracts entire, leaves wanting the line of moniliform cells, which are so obvious across the leaves of *F. tamarisci.*

Radula complanata Dumort. On trunks of trees and rocks; common.

Porella lævigata Lindb. Plentiful and very fine on wet rocks.—*P. Thuja* Tayl. On rocks and stones. —

Pleurozia cochleariformis Dumort. Plentiful in damp boggy places amongst the heather.

Lepidozia reptans Dumortier, Hook. Plentiful in damp shady places.—*L. cupressina* Dumort.

Bazzania trilobata B. Gray. In rocky places; not in such abundance as it is found in the South and West of Ireland. A well-marked plant, easily known by the large quadrate under leaves, which are wider than the stem.

Cephalozia Sphagni Spruce. Plentiful amongst Sphagnums and other mosses in damp places. — *C. elachista* Lindb. On damp banks; rare. Dr. Lindberg, 1873; D. McA., 1887-88.—*C. bicuspidata* Dumort. On shady banks; common. —Var. *uliginosa* Nees, Eur. Leberm. ii. 253; *Jungermannia Lamersiana* Hübn. Hep. Germ. 165; *J. bicuspidata* E. Bot. t. 2239. Swampy places amongst Sphagnums, margins of streams, and amongst the fronds of *Pellia.* Dr. Spruce states that this can hardly be considered more than the diœcious and perfect form of *C. bicuspidata.* Whether species, subspecies, or variety, it is most easily to distinguish from *C. bicuspi-*

data by its much larger size, tufted growth, diœcious inflorescence, and the female flowers terminating long branches. — *C. curvifolia* Dumort. On rotting trunks; very rare in this part of Ireland. D. McA. & F. W. M., 1879. — *C. connivens* Dicks. Damp shady places on wet peat-moss and decayed wood, and mixed with the larger *Hepaticæ:* rare or overlooked. — Var. *α*, *conferta minor*. On decayed wood, Dr. Moore.—Var. *β*, *sphagnorum* Hook. — *C. catenulata* Huben. In damp shady places on decayed wood.—Var. *pallida* Spruce. On rotting wood and turfy banks; rare. This form is new to the Irish Flora, D. McA., 1879.

Lophocolea bidentata Dumort. Plentiful on damp banks and decayed wood.

Harpanthus scutatus Spruce. On moist ground, and on damp shady rocks, in dense compact tufts. Stems a quarter of an inch in length, filiform; apex ascending, rarely branched; rootlets numerous, white, proceeding from the bases of the under leaves, which are conspicuous, ovate-lanceolate, acuminate, and slightly toothed at the base, connected by one side with the adjoining leaf; leaves imbricated, smaller at the apex and base of shoots, distant below, secund, connivent towards the apex, roundish, ovate, concave, sharply bidentate, sinus lunate, margins entire, the dorsal decurrent for a short distance; of a pale olive colour. On moist banks and amongst mosses; a rare and local plant.

Kantia trichomanes B. Gray. Common on wet shady banks; rare in fruit.—*K. arguta* Lindb. On wet banks amongst *Sphagnum*, D. McA., 1878.

Saccogyna viticulosa Dumort. Plentiful in damp places.

Trichocolea tomentella Dumort. Dr. Moore, *fide* Carrington in Trans. Bot. Soc. Edin. vii. p. 453. This has not been found amongst our numerous gatherings in this locality.

Herberta adunca Dicks. Boggy places and on wet rocks.

Blepharostoma trichophylla Dumort. On turfy heaths and amongst *Sphagnum*. A pretty and well-marked plant; rare in this locality. —*B. setacea* Mitt. Abundant on peat in shady places.

Scapania subalpina Dumort. Plentiful by the margins of streams and on stones, where it is often submerged. — Var. *undulifolia*. Common in wet places, often in the bed of the mountain streams. Stems more slender, having copious radicles, leaves broader than in the type and more spreading.—*S. undulata* Dumort. Plentiful; margins of the mountain streams and in boggy places. — Var. *purpurascens* Hüb.—Var. *major* Carrington. — *S. irrigua* Dumort. Damp banks and in marshy places; a scarce plant. Dr. Moore; D. McA. & F. W. M., 1889. — *S. resupinata* Dumort. Among the moist rocks in shady places, D. McA. & R. W. S., 1889.—*S. nemorosa* Dumort. Plentiful on damp shady banks. — Var. *purpurascens* Hook. This may be a variety of *S. undulata*, but we find so many forms of both species that it is difficult to say which it belongs to.—*S. umbrosa* Dumort. Plentiful in moist shady places, on decayed wood. Dr. Moore & S. O. Lindberg, 1873; D. McA., 1887–89.—*S. curta* Dumort. Moist banks; rare.

Diplophyllum albicans Dumort. Abundant on moist banks, &c.

Plagiochila asplenioides Dumort. Plentiful on damp banks.—*P. spinulosa* Dumort. Plentiful in woods and on damp banks.

Mylia Taylori B. Gray. On damp ground, in large patches. — *M. anomala* B. Gray. Considered by many hepaticists a doubtful species, and closely allied to the former. Dr. Carrington states the cells are of a different form from those in *M. Taylori*, and contain fusciform corpuscles, and we have observed, amongst other differences, that it wants the papillose character of the outer cell-wall, so obvious in *M. Taylori*. Hab. Amongst *Sphagnum*, D. McA. & F. W. M., 1889. We have gathered the same plant on Brandon Mountain, Kerry, in 1881.

Jungermania crenulata Sm. Abundant by the roadside, D. McA. & R. W. S., 1889.—Var. *gracillima* Hook. Abundant; often mixed with the preceding. Dr. Moore states that at Westaston, Co. Wicklow, this variety is abundant, and none of the true *crenulata* grows with it.—*J. pumila* With. In the crevices of damp rocks near streams, Dr. Moore.—*J. sphærocarpa* Hook. Abundant on wet rocks and on the margin of the lake, on the damp bank among stones.—*J. riparia* Tayl.—*J. nana* Nees. Stems cæspitose, from a quarter to half an inch high; *innovations* arising below the apex, slender, terete; cells large, pellucid, those of the margin somewhat larger; perianth obtuse, plicate, quadrangular; mouth *four-toothed*, capsule globose. On wet banks near streams; apparently a rare plant in Ireland, and closely allied to *J. crenulata* and *gracillima*.—*J. Dicksoni* Hook. On rocks and moist banks, very rare; single stems only (*Dr. Moore*). The re-discovery of this plant in this or any other locality would be interesting.—*J. minuta* Crantz. Damp peaty banks; also found creeping over the naked moist rocks in shady places. Plentiful in fruit, in which state it is rarely found. D. McA. & R. W. S., 1889. — *J. exsecta* Schmidel. Damp banks; rare. D. McA., 1889 (♂). Easily known from all others by the distichous leaves, furnished above the middle of the upper margin with a strong sharp tooth, which points obliquely to the apex.—*J. intermedia* Lindenb. On damp banks between rocks, D. McA., 1887.—*J. ventricosa* Dicks. Plentiful on damp banks.—*J. bicrenata* Lindenb. On damp shaded banks. — *J. incisa* Schrad. On damp turfy banks; rare. — *J. porphyroleuca* Nees. On decaying wood; rare. D. McA., 1889. — *J. inflata* Huds. On wet rocks and in boggy places; abundant near the summit of Kippure Mountain, bearing colesule. D. McA., September, 1880.

Nardia emarginata B. Gray. Abundant on wet rocks. — *N. sphacelata* Carrington. On moist rocks; rare. Often mixed with the preceding. Dr. Moore, 1869, *fide* Lindberg, S. O. L. 1873. F. W. Moore, 16th July, 1887; plentiful. D. McA. & R. W. S., 1889 (fruit). — *N. scalaris* S. F. Gray. Abundant on moist banks and on wet rocks.—Var. *rivularis* Lindberg. Plentiful on wet rocks. —Var. *robusta* Lindberg. A very variable plant; easily known from *N. hyalina* and *N. obovata* by the white rootlets.—*N. compressa* B. Gray. Abundant on wet rocks where the water is more or less trickling over it, and is often submerged.—Var. *rigida* Lindberg. This form comes near to *N. sphacelata*. Stems shorter, narrower, and more rigid, more branched, more densely foliaceous, and here and there flexuose; leaves more spreading and rigid; cells twice the size and thickened, generally highly coloured. Dr. Lindberg states that this form is intermediate between the typical form of the species and its variety *Carringtoni*.—*N. obovata* Carrington. Moist rocks and on damp banks. — *N. hyalina* Carrington. Moist banks and by the sides of streamlets in rocky places; rare. Dr. Moore. D. McA. & F. W. M., 1887.

Pallavicinia hibernica B. Gray. Marshy bank amongst *Sphagnum;* rare. A well-marked plant, differing from the following in wanting the true nerve possessing ligneous fibres, and having one the substance of which does not differ essentially from the rest of the frond; it is a larger plant, branched in a remarkable dichotomous manner, not unlike *Metzgeria furcata*. — *P. Lyellii* B. Gr. Boggy places; bank by the margin of a stream; rare. Dr. Taylor. D. McA., 1887.

Pellia epiphylla Corda. Abundant on the margins of streams and damp ground.—*P. calycina* Tayl. On moist shady banks and on stones; rare.

Metzgeria furcata Dumort. On the trunks of trees and decayed wood.

Riccardia multifida B. Gr. On wet boggy places; plentiful.—Var. *pinnatifida* Dumort. In wet boggy places; plentiful. — *R. pinguis* B. Gr. Damp boggy places; often submerged.

NEW STATIONS OF IRISH PLANTS.

By Cecil Butler, M.A.

The following is a list of plants which I gathered this year in the neighbourhood of Castlebellingham, Co. Louth. I have to thank Mr. A. G. More for looking over them with a view to recording them in the next edition of the 'Cybele Hibernica'; and I am also obliged to Mr. Arthur Bennett for naming *Potamogeton obtusifolius* and *Allium carinatum* for me.

Ranunculus penicillatus Hiern. Plentiful in River Glyde. — *R. Lingua* L. Plentiful in Ardee Bog, and also in a bog locally known as "The Glack."

Papaver Argemone L. A few plants on waste ground by seashore.

Sinapis nigra L. Rough ground by sea near Dunany.

Drosera anglica Huds. Plentiful in Ardee Bog.

Silene anglica L. and *S. noctiflora* L. Plentiful in sandy cornfields by the sea.

Stellaria glauca With. Glack.

Geranium columbinum L. A few plants. — *G. pyrenaicum* L. Plentiful.

Trifolium arvense L. Sparingly at Clogher Head.—*T. hybridum* L. Common in fields.

Valerianella Auricula Dietr. In corn-fields by the sea.

Silybum Marianum Gaertn. Road-side.

Cuscuta Trifolii Bab. Clover-field.

Cynoglossum officinale L. Waste places by sea-shore.

Mertensia maritima Don. Sparingly on shores of Dundalk Bay.

Hyoscyamus niger L. Sea-shore.

Orobanche Hederæ Duby. Plentiful in Castle Woods.—*O. minor* L. In same field with *Cuscuta Trifolii*. The farmer did not know the name of either plant, but said they both appeared in his fields about three years ago. They are plentiful there now.

Utricularia minor L. Ardee Bog and Flack.

Obione portulacoides Moq. Salt-marsh.

Hydrocharis Morsus-ranæ L. Plentiful.

Anacharis Alsinastrum Bab. Pond at Barmeath.

Epipactis palustris L. Marshy ground.

Allium carinatum L. (Fries). A dozen or more plants growing on a grassy bank near Maine House, 1½ mile from Castlebellingham. There used to be a garden next the bank, but it was ploughed up in 1880, and the field has been arable land ever since; so the *Allium* seems to be naturalized now, though it might have been cultivated once. There may be more plants, as I did not search the ground carefully. I have not observed it elsewhere in the district.

Juncus obtusiflorus Ehrh. Marshy ground near the sea.

Potamogeton obtusifolius Mert. & Koch. Flack.

Cladium Mariscus R. Br. Marshy ground.

Carex extensa Good. Salt-marsh at Clogher Head.

The three following I have found in other districts:—

Viola lutea Huds. Dry grassy top of Dunmurry Hill, Co. Kildare, 1887.

Geum rivale L. Damp woods at Rathaugan, Co. Kildare, 1887.

Atriplex arenaria Woods. Sea-shore near Newcastle, Co. Down, 1890.

THE GENUS *XYSMALOBIUM*.

By G. F. Scott Elliot, M.A., F.L.S.

This small genus is closely related to *Gomphocarpus*, and may be regarded as an offshoot from the section *Pachycarpus*. The eleven species represented in the Kew and British Museum Herbaria show a very interesting distribution. None are (so far as one can judge from the imperfect labels of most collectors) found in the dry south-western part of Cape Colony, or in the arid plains of the Karroo; but the mountain-summits of Caffraria, the table-land of the Transvaal, Basutoland, Griqualand East, Natal, Zululand, and the Shiré Highlands are all inhabited by one or more of the wide-ranging species. Two species are confined to Natal, two to Angola, and two to detached mountains of the eastern district (Winterberg and Stockenstrom). The genus may therefore have arisen from some *Gomphocarpus* of the southern part of the Central African table-land, and thence spread southwards as far as Port Elizabeth, and westward as far as Angola. The following key may be of use in distinguishing the species:—

A. Leaves ovate, with revolute margins.	
a. Leaves glabrous; peduncle short.	
Gynostegium shorter than the anthers	1. *padifolium.*
Gynostegium as long as the anthers	2. *confusum.*
b. Leaves sparsely hairy; peduncle short.	
Leaves twice as long as broad	3. *parviflorum.*
Leaves thrice as long as broad	4. *Gerrardi.*
c. Peduncle 3 cm. or more in length	5. *pedunculatum.*
B. Leaves elongate-lanceolate, tapering very gradually from a broad base, with crisped undulate margin (except 9).	
Petals bearded with long chaffy hairs.	6. *undulatum.*
Petals bearded with short silvery hairs	7. *Stockenstromense.*
Petals not distinctly bearded	8. *gomphocarpoides.*
Gynostegium much longer than the anthers	9. *angolense.*
C. Leaves linear-lanceolate.	
Margin of leaf scabrid	10. *involucratum.*
Margin of leaf not scabrid	11. *Holubii.*

1. X. PADIFOLIUM. *Gomphocarpus padifolius* Baker (Refug. Botan. t. 254). "Itshongwe," native name. Natal: Port Natal, *Gueinzius*! Near Verulam, *Wood* 912! *Gerrard* 1284! Inanda, *Wood* 1254! Umhlongwe, April, 1884, *Wood* 3013! From Zululand: Ungoya, alt. 1000 ft., May 5, 1887, *Wood* 3924! From Kaffraria: On hills, Bazija, alt. 2000 ft., *Baur* 819! Shiré Highlands: Blantyre, *Last*!

2. **X. confusum**, n. sp. Stem stout, somewhat fleshy, and bifariously hairy. Leaves elliptic-ovate, retuse, apiculate; margin denticulate and thickened. Peduncles 0 or short. Bracts small, subulate. Pedicels 7–15. Sepals linear-lanceolate, acute, almost as long as the petals. Petals ovate, subacute, with reflex margins. Corona-scales, viewed from without, broadly obovate (the tip and sides towards their bases are really doubled inwards), and rising to about half the height of the anthers. Anthers very short, not overtopping the gynostegium. Leaves 5–15 cm. long, 2–6 cm. broad. Pedicels 1·5 cm. long. Flowers about 1 cm. long and 8 mm. in diameter. — Natal, *Mrs. Saunders*! *Gerrard* 1282! Inanda, *Wood* 1163!

3. **X. parviflorum** Harv. MS. Stem sparsely and roughly hairy. Leaves ovate or triangular-ovate, acute or acuminate, shortly petiolate, sparsely hairy, margin revolute. Peduncles longer than pedicels (8–10-flowered). Sepals lanceolate, acute,

apiculate, and (as the petals) hairy externally. Petals broadly ovate, obtuse, not bearded. Corona-scales ligulate, longer than the gynostegium. Leaves 2–4 cm. long, 1·5–2 cm. broad. Peduncles 2–3 cm. Pedicels under 1 cm. Flowers 4–5 mm. long, and 6 mm. in diameter. — Natal: *Gerrard* 1288! Dingle Farm, *Mrs. Fannen*! Wienen, 3-5000 ft., *Sutherland*! Transvaal: In lapidosis Pretoria, *M'Lea*, *Bolus* 5704! Basutoland: *Cooper* 934! Lombards and Rietfontein, 1813, *Burchell* 4151!

4. **X. Gerrardi**, n. sp. Undershrub. Stem bifariously hairy. Leaves elliptic-ovate, acute, rounded at base, sparsely and roughly hairy on both sides, with the margin revolute. Peduncles longer than the pedicels (10–20 in an umbel). Bracts linear-lanceolate. Sepals, bracts, and one side of pedicels covered with rather long, scattered hairs. Sepals subulate, small. Petals elliptic-ovate, obtuse. Corona-scales clavate, fleshy, longer than the gynostegium. Leaves 3·5–7 cm. long, and 1–2 cm. broad. Peduncles 1·5–2 cm. long. Pedicels under 1 cm.—Natal: *Gerrard* 1951! 1289! *Mrs. Saunders*!

5. X. PEDUNCULATUM Harv. Thes. Cap. ii. 8, t. 112. — Winterberg, *Mrs. Barber* 82! *Zeyher* 41.

6. X. UNDULATUM R. Br. in Mem. Wern. Soc. i. 39. *X. lapathifolium* Dcne. in DC. Prod. viii. 519. — Mountains of Eastern Districts and Natal: Paarlberg and Uitvlugt, secus fluvios et rivulos in fruticetis humidis alt. 2000–4000 ft., *Dreye*! Zuureberge! Seven Fountains! Port Elizabeth! ad rivulos Prov. Richmond, *Bolus* 2054! Albany, *Bowker*! Moist grassy spots, Bothasberg, Grahamston, alt. 2200 ft., *Macowan* 404! Transkei Schiloh, *Baur* 947! Natal; *Cooper* 2745! Near Estcourt, 3800 ft., Dec. 23, *Wood* 3474! In the Goester Valley, and at foot of the Tradesberg, *Bowie*!

Var. *X. ensifolium* Burch. MS. Leaves revolute, scarcely erose or undulate.—Great Klibbolikhonni Spruit, near Litakun, Betschuanaland, Dec. 12, *Burchell* 2491! Upper Spring, Grootefontein, Nov. 18, 1811, *Burchell* 1834!

7. X. GOMPHOCARPOIDES Dcne. in DC. Prod. viii. 519. — Eastern and Northern districts: In mont. Sneeuwbergen prope Graaff Reinet, Dec., alt. 4100 ft., *Bolus* 635! In collibus graminosis prope Schiloh, alt. 4000 ft.; prope Loeuwfontein inter Sternbergspruit et Colesberg, alt. 4500 ft., *Dreye*! Colesberg, *J. Shaw*! Waschbanks River, March (in fruit), *Burchell* 2740!

8. **X. Stockenstromense**, n. sp. Stem erect, rather fleshy, subglabrous. Leaves lanceolate-attenuate, acute, and at base subcuneate; glabrous, except at the denticulate, slightly thickened, and undulate margin. Umbels pedunculate, solitary or in pairs, about 15-flowered. Sepals lanceolate, acute, half as long as the petals, and, like them, sparsely hairy on the back. Petals ovate-lanceolate, acute, within densely covered with very short silvery hairs. Corona-scales semicircular, with the midrib thickened, almost toothlike internally, shorter than the anthers. Leaves 10–12 cm. long, 3–4 cm. broad. Peduncles 3 cm. Pedicels 1·5 cm. long. Flowers 6–8 cm. long, and nearly as broad.—

Scrubby slopes of Lushington Mtn., near Stockenstrom, Dec. 1884, *Scully* 169!

9. **X. angolense,** n. sp. Root tuberous. Stem striate, at first very pubescent, eventually almost glabrous. Leaves elongate-lanceolate, subhastate at base, slightly glaucous below, margin subrevolute and denticulate. Peduncles and pedicels shortly hairy. Umbel 6–16-flowered. Sepals pale yellow (*teste Welwitsch*), lanceolate-ovate, subglandular at apex. Petals pink (sordide violacei, *Welwitsch*), shorter than the sepals, slightly bearded within, ovate, obtuse, emarginate, united below to the gynostegium. Corona-scales ovate, triangular, obtuse. Gynostegium much longer than the anthers (which distinguishes this species from all others). Leaves 10–16 cm. long, 2 cm. broad; petiole 3 mm. Peduncles 2 cm. and pedicels 1–2 cm. long. Sepals 7–8 mm. Flowers 1 cm. in diameter.—Huilla, 14°–16° lat. austr.: in pascuis humidis de Catumba versus Ohai, Jan. Febr. 1860, *Welwitsch* 4171! freq. in paludosis juxta rivulas prope Huilla et Humpata, *Welwitsch* 4170!

10. X. INVOLUCRATUM Dcne. in DC. Prod. viii. 519. — Eastern Districts and Natal, common. Albany, *Macowan* 654! *Cooper* 472! 2736! *Zeyher*! Riet fontein, 25 Oct. 1813, *Burchell* 4147! Kreili's Country, *Bowker*! Bazija, Nov., alt. 2–2500 ft., *Baur* 383! *Mrs. Barber* 36! 83! In graminosis clivis montis Currie, Griqualand East, Dec., 5000 ft., *Tyson* Herb. Norm. 546! Natal, Inanda, *Wood* 364! *Sanderson* 373! *Gerrard* 1801! Mooi River, alt. 4000 ft., 28 Dec., *Wood* 4063!

11. **X. Holubii,** n. sp. Root woody, tuberous (secondary roots also tuberous). Stem finally nearly glabrous, at first crisply hairy. Leaves rather fleshy, subcylindrical, not scabrid at margin, linear-elongate. Umbels pedunculate, 25–30 flowered. Bracts ligulate. Sepals not half as long as petals, concave, eventually reflex. Petals (albido lilacini, *Welwitsch*) reflex, lanceolate-ovate, subacute. Corona-scales short, peltately affixed, circular at base, with minute alternate squamellæ. Gynostegium narrowest at base of anthers, subcylindrical. Capsule elongate, fusiform, glabrous. Leaves 10–20 cm. long, and 3 mm. broad. Peduncles 1 cm.; pedicels 5–6 mm. long. Petals 3 mm. long. — Leshumo Valley, *Holub*! Huilla, in collibus dumetosis herbidisque rarior prope Lopollo, Dec. 1859, *Welwitsch* 4175!

Excluded Species.

X. *grandiflorum* Br. = *Pachypus grandiflorus* E. Mey.

The following species are unknown to me :—

X. *Heudelotianum* Dcne. in DC. Prod. viii. p. 520.
X. *sessile* Dcne., id. p. 519.
X.? *linguæforme* Harv. MS.; Journ. Linn. Soc. xiii. 50.
X. *prunelloides* Turcz. in Bull. Soc. Imp. Nat. Mosc. xxi. 255 (1848).

INTRODUCED PLANTS IN WEST CORNWALL.

By W. Roberts.

The plants in the following list nearly all occur, or have occurred, within a few yards of one another on a barren piece of ground known as the Eastern Green, which borders the railway-cutting between Penzance and Marazion, and fringes the beach. Within a mile, in a direct line inland, is situated an extensive flour mill, which receives large cargoes of wheat from ports in America, from Dantzic, from the Black Sea and the Sea of Azov, and from Egypt and India. As the corn is winnowed on the Eastern Green, and as in the nature of things it inevitably contains a greater or lesser percentage of the seeds of various weeds, it is only natural that some of this "chaff" falls on suitable soil and springs into growth.

In most cases their life is brief, and in very few instances do they appear a second year. They rarely give one the impression of being typical specimens. The climate in the first place, the station in the second, and the fact that the ground is already densely occupied with vegetable growth of a vigorous character in the third, are fatal elements to the acclimatisation of weakly cornfield denizens. The plants in question appear, for the most part, to thrive only under special circumstances, although the geographical distribution of nearly every one is wide. DeCandolle, in his 'Géographie Botanique Raisonnée,' tells us that it is not so much a total annual average amount of heat that a plant requires to enable it to vegetate, to flower, or to ripen its seed, as that this heat shall never descend below or ascend above certain extremes, and that it shall remain within those limits for a sufficient length of time for the completion of these operations, a period of time which may be shortened or lengthened according to the greater or less intensity of the heat received by the plant within the above limits. This exactly defines the position of the colony of additions to the Flora of West Cornwall. The absence of extremes—heat and cold—is fatal to their welfare. It is also an interesting fact to note that nearly the whole of these additions are normally of annual duration, so that the chances are materially increased against self-propagation.

I am indebted to a local botanist, Mr. W. A. Glasson, for a complete list, and also for specimens: the names have been verified by Mr. N. E. Brown. The "Eastern Green" and the neighbourhood which terminates at one point with the Marazion marshes is peculiarly rich in its flora, and during the past half-century the late John Ralfs noticed and recorded the names of several plants to which, regarding as aliens, he paid very little attention. Mr. Glasson began his observations in the summer of 1885, when he found *Saponaria Vaccaria*, which had been observed near the Logan Rock in 1878 by Dr. Fraser; the next species, which had also been observed before, was *Echinospermum Lappula*, and, finding these two plants, Mr. Glasson was led to pay close attention to the district.

Cruciferæ.—*Alyssum campestre, A. incanum, Sisymbrium altissimum, S. pannonicum, S. Loeselii, S. orientale, Brassica juncea, Eruca sativa, Lepidium perfoliatum, L. virginianum, Neslia paniculata, Rapistrum orientale.*

Caryophylleæ.—*Saponaria Vaccaria, Silene Fabaria, S. dichotoma.*

Malvaceæ.—*Malva borealis.*

Leguminosæ. — *Trigonella Fœnum-græcum, T. polycerata, T. cærulea, Medicago procumbens, Cicer arietinum, Vicia villosa, Ervum Lens, Lathyrus sativus.*

Umbelliferæ.—*Ammi majus, Orlaya grandiflora.*

Rubiaceæ.—*Asperula arvensis.*

Compositæ.—*Ambrosia artemisiæfolia, Xanthium spinosum, Madia racemosa, Anthemis Chamomilla, A. altissima, A. clavata, A. ruthenica, A. Neilreichii, A. incrassata, Artemisia scoparia, Xeranthemum cylindraceum, Centaurea diffusa, C. melitensis.*

Polemoniaceæ.—*Gilia capitata, G. achilleæfolia.*

Boragineæ.—*Echinospermum patulum, Amsinckia lycopsioides, A. angustifolia.*

Plantagineæ.—*Plantago arenaria.*

Amarantaceæ.—*Amarantus Blitum.*

Chenopodiaceæ.—*Chenopodium aristatum.*

Cannabineæ.—*Cannabis sativa.*

Liliaceæ.—*Asphodelus fistulosus.*

Gramineæ.—*Panicum capillare, Koeleria phleoides, Bromus arduennensis, Lolium siculum, Secale cereale, Ægilops caudata.*

In addition to the foregoing, Mr. Glasson's two lists include the following plants, which are indigenous to, or have been naturalised in, other parts of Great Britain, but which do not belong properly to the flora of West Cornwall:—*Erysimum orientale, Lepidium campestre, L. ruderale, Sisymbrium Irio, S. Sophia, Camelina sativa, Linum usitatissimum, Geranium pusillum, Vicia lathyroides, Caucalis daucoides, Centaurea solstitialis, Hypochæris maculata, Anagallis cærulea, Echinospermum Lappula, Lycium barbatum, Agrostis spica-venti, Poa alpina, P. nemoralis, Alopecurus agrestis, Bromus madritensis, B. arvensis,* and *Hordeum pratense.*

SYNOPSIS OF GENERA AND SPECIES OF *MALVEÆ.*

By Edmund G. Baker, F.L.S.

(Continued from p. 343.)

Malva L.

Species non satis notæ.

Malva Berteroniana Steud. in Flora, 1856, p. 437.
M. Boryana DC. Prod. i. p. 435.
M. brasiliensis Desrous; DC. Prod. i. p. 433.
M. brevipes Phil. Anales Univ. (1870), ii. p. 163.
M. campanuloides Lodd. Bot. Cab. t. 1670.

M. cognata Steud. in Flora, 1856, p. 425.
M. cordistipula Steud. in Flora, 1856, p. 425.
M. hibiscoides Desrous; DC. Prod. i. p. 435.
M. horrida Span. in Linnæa, xv. p. 168.
M. incana Presl, Reliq. Haenk. ii. p. 121.
M. patagonica Niederl. Bot. Expedic. Rio Negro, p. 196.
M. peduncularis Hook. & Arn. Bot. Misc. iii. p. 150.
M. pinnatipartita St. Hil. & Naud. Ann. Sc. Nat. Ser. 2, xviii. p. 46.
M. polyantha Steud. in Flora, 1856, p. 426.
M. ptarmicæfolia St. Hil. & Naud. Ann. Sc. Nat. Ser. 2, xviii. p. 46.
M. pulchra Boj. Hort. Maurit. p. 25.
M. tenella Cav.; DC. Prod. i. p. 433.
M. tomentosa L.; DC. Prod. i. p. 430.
M. trionoides DC. Prod. i. p. 433.

Species exclusæ.

M. abutiloides L. = *Sphæralcea abutiloides* Endl.
M. acaulis Cav. = *Malvastrum acaule* A. Gray.
M. acerifolia Nutt. = *Sphæralcea acerifolia* Nutt.
M. albens E. Mey. = *Malvastrum albens* Harv.
M. americana Cav. = *Malvastrum tricuspidatum* A. Gray.
M. americana L. = *Malvastrum spicatum* A. Gray.
M. amoena Drège = *Malvastrum grossulariæfolium* Gray & Harv.
M. amoena Sims = *Malvastrum calycinum* Garcke.
M. angustifolia Cav. = *Sphæralcea angustifolia* St. Hil.
M. anomala Link. & Otto. = *Sphæralcea elegans* Don.
M. anomala E. & Z. = *Sphæralcea elegans* Don.
M. antofagastana Phil. = *Malvastrum antofagastanum.*
M. arborea Webb = *Lavatera arborea* L.
M. asperrima Jacq. = *Malvastrum asperrimum* Garcke.
M. asperrima E. & Z. = *Malvastrum dissectum* Harv.
M. asterocarpa Steud. = *Malvastrum.*
M. astrolasia Zipp. = *Malvastrum spicatum* A. Gray.
M. aurantiaca Scheele = *Malvastrum Wrightii* Walp.
M. balsamica Jacq. = *Malvastrum capense* Garcke, var.
M. Behriana Schlecht. = *Lavatera plebeia* Sims.
M. Belloa Gay = *Malvastrum Belloa.*
M. betulina Desrous = *Malvastrum.*
M. betuloides Schrad. = *Malvastrum.*
M. biflora Desrous = *Malvastrum.*
M. bonariensis Cav. = *Sphæralcea bonariensis* Griseb.
M. borbonica Willd. = *Malvastrum tricuspidatum* A. Gray.
M. brachystachya F. v. Muell. = *Malvastrum spicatum* A. Gray.
M. bryonæfolia Drège = *Malvastrum grossulariæfolium* Gray & Harv., var.
M. bryonifolia L. = *Malvastrum bryonifolium* Gray & Harv.?
M. californica Presl = *Sida hederacea* Torr.
M. calycina Cav. = *Malvastrum calycinum* Garcke.
M. campanulata Paxt. = *Malvastrum purpuratum.*
M. capensis Cav. = *Malvastrum capense* Garcke.
M. capitata Cav. = *Malvastrum capitatum.*

M. caroliniana L. = *Modiola multifida* Moench.
M. coccinea Nutt. = *Malvastrum coccineum* A. Gray.
M. corchorifolia Desrous. = *Malvastrum Rugelii* Watson.
M. coromandeliana L. = *Malvastrum tricuspidatum* A. Gray.
M. costata Presl = *Malvastrum* near *M. peruvianum* A. Gray.
M. Creeana Graham = *Sphæralcea pedata* Torr.
M. curassavica Desrous. = *Malvastrum.*
M. cymbalariæfolia Desrous. = *Sida Sherardiana* Hook. f.
M. Cyrilli Vis. = *Lavatera Thuringiaca* L., var. *ambigua.*
M. decumbens Willd. = *Modiola multifida* Moench.
M. deflexa Turcz. = *Malvastrum grossulariæfolium* Gray & Harv.
M. digitata Torr. & Gray = *Callirhoe digitata* Nutt.
M. Dilleniana E. & Z. = *Malvastrum virgatum* Gray & Harv., var.
M. divaricata Andr. = *Malvastrum divaricatum* Garcke.
M. domingensis Spr. = *Malvastrum tricuspidatum* A. Gray.
M. echinata Presl = *Malvastrum.*
M. elegans Cav. = *Sphæralcea elegans* Don.
M. eriocarpa DC. = *Modiola multifida* Moench.
M. erodiifolia Presl = *Malvastrum erodiifolium.*
M. fasciculata Nutt. = *Malvastrum Thurberi* A. Gray.
M. fluminensis Vell. = *Malvastrum spicatum* A. Gray.
M. fragrans Bot. Reg. = *Malvastrum capense* Garcke, var.
M. fragrans Jacq. = *Malvastrum capense* Garcke, var.
M. gangetica L. = *Malvastrum tricuspidatum* A. Gray.
M. geranioides Ch. & Sch. = *Malvastrum geranioides* Hemsl.
M. geranioides Gill. = *Modiola geranioides* Walp.
M. Gillesii Steud. = *Modiola geranioides* Walp.
M. glomerata Hook. & Arn. = *Malvastrum glomeratum* Griseb.
M. grossulariæfolia Cav. = *Malvastrum grossulariæfolium* Gray & Harv.
M. grossulariæfolia E. Mey. = *Malvastrum albens* Harv.
M. Haenkeana Presl = *Malvastrum* near *M. peruvianum* A. Gray.
M. hederacea Dougl. = *Sida hederacea* Torr.
M. hederæfolia Vis. = *Lavatera cretica* L.
M. Hornschuchiana Walp. = *Sphæralcea.*
M. Houghtonii Torr. & Gray = *Callirhoe triangulata* A. Gray.
M. humilis Gill. = *Malvastrum humile* A. Gray.
M. involucrata Torr. & Gray = *Callirhoe involucrata* A. Gray.
M. lactea Ait. = *Malvastrum vitifolium* Hemsl.
M. læta Phil. = *Malvastrum tenuifolium.*
M. lasiocarpa St. Hil. et Naud. = *Malvastrum lasiocarpum* Griseb.
M. lateritia Hook. = *Malvastrum lateritium* Nicholson.
M. Le Contei Buckley = *Pavonia hastata* Cav.
M. leprosa Ort. = *Sida.*
M. Lindheimeriana Scheele = *Malvastrum tricuspidatum* A. Gray.
M. limensis L. = *Malvastrum peruvianum* A. Gray, var.
M. lineariloba Young = *Callirhoe involucrata* A. Gray, var.
M. luzonica Blanco = *Malvastrum tricuspidatum* A. Gray.
M. malachroides Hook. & Arn. = *Sidalcea malachroides* A. Gray.
M. macrostachyum Presl = *Malvastrum macrostachyum* Hemsl.
M. malwensis Edgw. = *Althæa Ludwigii* L.

M. mamillosa Lloyd = *Lavatera cretica* L.
M. Mathewsii Turcz. = *Malvastrum peruvianum* A. Gray.
M. mendocina Phil. = *Sphæralcea mendocina* Phil.
M. mexicana S. Schauer. = *Malvastrum mexicanum* Hemsl.
M. microphylla E. Mey. = *Malvastrum divaricatum* Garcke.
M. miniata Cav. = *Sphæralcea miniata* Spach.
M. multicaulis Schlecht. = *Malvastrum multicaule* Britton.
M. Munroana Dougl. = *Sphæralcea Munroana* Spach.
M. muricata Cav. = *Sphæralcea.*
M. nubigena Wedd. = *Malvastrum nubigenum.*
M. nuttalioides Croom. = *Callirhoe Papaver* A. Gray.
M. obliqua Nutt. = *Sida hederacea* Torr.
M. obtusiloba Hook. = *Sphæralcea obtusiloba* Don.
M. odorata Maund. = *Malvastrum.*
M. operculata Cav. = *Malvastrum operculatum?*
M. oriastrum Wedd. = *Malvastrum Oriastrum.*
M. ovata Cav. = *Malvastrum spicatum* A. Gray.
M. oxycanthoides E. & Z. = *Malvastrum divaricatum* Garcke.
M. oxycanthoides Horn. = *Malvastrum tridactylites* Garcke.
M. Papaver Cav. = *Callirhoe Papaver* A. Gray.
M. parnassifolia Wedd. = *Malvastrum parnassifolium* A. Gray.
M. pedata Torr. & Gray = *Callirhoe digitata* Nutt.
M. perpusilla Nutt. = *Malvastrum angustum* A. Gray?
M. peruviana L. = *Malvastrum peruvianum* A. Gray.
M. plicata Nutt. = *Sida hederacea* Torr.
M. plumosa Presl = *Malvastrum plumosum* A. Gray.
M. polystachya Cav. = *Malvastrum spicatum* A. Gray.
M. Preissiana Miq. = *Lavatera plebeia* Sims.
M. prostrata Cav. = *Modiola multifida* Moench.
M. prostrata Phil. = *Sphæralcea bonariensis* Griseb.
M. Pseudolavatera Webb. = *Lavatera cretica* L.
M. punicea Nutt. = *Sphæralcea.*
M. purpurata Lindl. = *Malvastrum purpuratum.*
M. purpurea Cl. Gay = *Malvastrum purpuratum.*
M. Purdiæi Wedd. = *Malvastrum Purdiæi* A. Gray.
M. pygmæa Wedd. = *Malvastrum pygmæum* A. Gray.
M. racemosa E. Mey. = *Malvastrum racemosum* Harv.
M. reflexa Andr. = *Malvastrum tridactylites* Garcke.
M. retusa Cav. = *Malvastrum retusum?*
M. retusa E. & Z. = *Malvastrum calycinum* Garcke.
M. rhizantha Wedd. = *Malvastrum rhizanthum* A. Gray.
M. ribifolia Schlecht. = *Malvastrum ribifolium* Hemsl.
M. Richii Wedd. = *Malvastrum Richii* A. Gray.
M. rivularis Dougl. = *Sphæralcea acerifolia* Nutt.
M. rosea DC. = *Meliphlea vitifolia* Zucc.
M. ruderalis Bl. = *Malvastrum tricuspidatum* A. Gray.
M. rugosa Desrous = *Malvastrum.*
M. rugosa E. & Z. = *Sphæralcea elegans* Don.
M. scabra Cav. = *Malvastrum scabrum* A. Gray.
M. scoparia Jacq. = *Malvastrum Rugelii* Watson.
M. scoparia L'Herit. = *Malvastrum scoparium* A. Gray.

M. scorpioides Turcz. = *Malvastrum peruvianum*, var.
M. Sherardiana L. = *Sida Sherardiana* Hook. f.
M. spicata Cav. = *Malvastrum spicatum* A. Gray.
M. spicata L. = *Malvastrum spicatum* A. Gray.
M. stellata Thunb. = *Malvastrum asperrimum* Garcke.
M. stellata Dietr. = *Sphæralcea angustifolia* Spach.
M. striata E. Mey. = *Sphæralcea elegans* Don.
M. stricta E. & Z. = *Malvastrum tridactylites* Garcke.
M. stricta Jacq. = *Malvastrum strictum* Gray & Harv.
M. subhastata Cav. = *Malvastrum tricuspidatum* A. Gray.
M. subtriflora Lag. = *Malvastrum subtriflorum* Hemsl.
M. sulphurea Gill. = *Sida sulphurea* A. Gray.
M. tenuifolia Hook. & Arn. = *Malvastrum tenuifolium*.
M. timoricensis DC. = *Malvastrum spicatum* A. Gray.
M. tarapacana Phil. = *Malvastrum tarapacanum*.
M. triangulata Leavenw. = *Callirhoe triangulata* A. Gray.
M. tricuspidata Ait. = *Malvastrum tricuspidatum* A. Gray.
M. tridactylites Cav. = *Malvastrum tridactylites* Garcke.
M. umbellata Cav. = *Meliphlea vitifolia* Zucc.
M. urticæfolia H. B. K. = *Modiola multifida* Moench.
M. venosa E. & Z. = *Sphæralcea elegans* Don.
M. violacea Phil. = *Sphæralcea*.
M. virgata Cav. = *Malvastrum virgatum* Gray & Harv.
M. virgata E. & Z. = *Malvastrum albens* Harv.
M. viscosa Salisb. = *Malvastrum*.
M. vitifolia Cav. = *Malvastrum vitifolium* Hemsl.
M. waltherifolia Link = *Malvastrum*.
M. Willkommiana Scheele = *Lavatera cretica* L.

(To be continued.)

PRIORITY OF PLACE IN BOTANICAL NOMENCLATURE.

By N. L. Britton, M.D.

The publication of my note in the October 'Journal of Botany' giving my reasons for taking up the generic name *Tissa* instead of *Buda* for the plants referred by recent authors to *Lepigonum* or *Spergularia*, and the comments thereon by the learned Editor, have put my position on this question squarely on record. I was sorry to have to take the means I did in order to induce him to print my communication, but I desired that my views should be given place in an English botanical journal, as well as in those of America. Mr. Britten, regarding my reasons as trivial, was justified, from his own standpoint, for declining to award them space in the "Journal," and his refusal, at first, to publish them has in no way diminished my regard for him.

But I do not believe that my reasons will be considered ridiculous by others who approach the topic from a different standpoint, and who have recognised the necessity of adopting methods of procedure which will render the system of nomenclature stable, which is all the "neo-American school" is trying to accomplish, and for which it, and all naturalists, have abundant authority. It is perfectly clear that as long as we allow ourselves a choice of names in any way, so long will authors differ in their acceptance and the settling of this important matter be deferred. That this end can be, at least approximately, reached by priority, has been the judgment of most recent naturalists. Whether some entirely different method may not commend itself to those of future decades, or some radical modification of the principles now employed be resorted to, it is at present impossible to surmise. It is, perhaps, not unlikely that some such move will be made. The American Ornithologists' Union settled it, so far as they were concerned, by driving bird-names back as far as they could, and then as a body adopted the results thus reached, so that they have been maintained for a considerable number of years. This process has commended itself to some others, but has not been put into operation elsewhere, so far as I am informed.

At all events, under the present methods of botanists it is important that all possibility of choice be removed as far as this is possible. For this reason I regard the "law" of the Paris Congress cited by Mr. Britten as authority for the use of *Buda* rather than *Tissa* as unfortunate and detrimental, and do not consider myself at all bound to follow it.

The number of cases in which change is desirable by reason of priority of place is not great. Mr. Britten cites the one of *Amygdalus* Linn. and *Prunus* Linn., the first standing on a page preceding the position of the second, and points out that he thinks it would be necessary to call all the species now in *Prunus*, *Amygdali*. It certainly would be strange for a while to make this substitution, but I think he has selected an unfortunate example in support of his argument. While it would probably be quite as philosophical to call a plum a peach, as a peach a plum, I personally prefer to call a peach a peach, and am prepared to maintain that *Amygdalus* and *Prunus* are distinct genera.

At some inconvenience, owing to its arrival on Nov. 20th, I print this note of Dr. Britton's in the present issue. I am sorry that Dr. Britton thought it necessary to bring against me the accusation quoted at p. 295, "in order to induce [me] to print [his] communication": his conduct might, and with many would, have induced an exactly opposite course.

I have only one remark to make. Dr. Britton has a perfect right to maintain the distinctness of *Amygdalus* and *Prunus*: but this does not invalidate my statement that "Bentham and Hooker and most other recent systematists unite them," and that, without ceasing "to call a peach a peach." I did not say I "*thought* it would be necessary to call all the species now in *Prunus*, *Amygdali*": I said that it *would* be so "on Brittonian principles," and Dr. Britton does not deny it. Will he carry out his principles in his next list?
—James Britten.

BIOGRAPHICAL INDEX OF BRITISH AND IRISH BOTANISTS.

By James Britten, F.L.S., and G. S. Boulger, F.L.S.

(Continued from p. 314.)

Swinhoe, Robert (1836 ?–1877): b. 1836 ?; d. London, 28th Oct. 1877. Consul at Formosa and Ning-po: at Amoy, 1861. F.R.S. Ornithologist, &c. 'List of Plants from Formosa,' 1863. Chinese Plants at Kew. R. S. C. v. 898; viii. 1048; Journ. Bot. 1878, 96. *Rubus Swinhoei* Hance.

Switzer, Stephen (1665 or 1682–1745): b. Hyde, near Winchester, circ. 1665, or East Stretton, Mitcheldever, Feb. 1682; d. 1745. Gardener under Loudon and Wise at Blenheim, 1706; with Lord Orrery, 1724–31. Had gardens on Millbank and near Vauxhall, and a shop in Westminster Hall. Visited France. 'Ichnographia,' 1718. 'Cythisus of the Ancients,' 1731. Pritz. 310; Cott. Gard. vi. 93; xiii. 53; Felton, 45; Donaldson, Agric. Biog. 44.

Sykes, William Henry (1790–1872): b. 25th Jan. 1790; d. London, 16th June, 1872. Lieut.-Col. Bombay Nat. Infantry. Zoologist, &c. F.R.S., 1834. In India from youth until 1831. M.P., Aberdeen, 1857. Lord Rector, Aberdeen, 1854–5. Chairman, H.E.I.C., 1856. Collected in Bombay. Pritz. 310; Proc. Royal Soc. 1871–72, xxxiii.; R. S. C. v. 899; 'Biog. Notices,' 1857, with portr. inserted in Brit. Mus. copy. *Sykesia* Arn.

Syme, John Thomas Irvine [*See* Boswell].

Symons, Rev. Jelinger (1778–1853): b. Low Leyton, Essex, 1778; d. Radnage, Bucks, 20th May, 1851; bur. Radnage. M.A., Cambridge, 1797. F.L.S., 1798. Curate at Whitburn, Durham. Rector of Radnage, 1833–51. 'Synopsis plantarum insulis Britannicis,' 1798. Sent list of Durham plants to Winch (Winch, Bot. Guide, ii. pref.). Pritz. 310; Jacks. 233; Proc. Linn. Soc. ii. 192.

Sympson, Alexander (fl. 1699). Surgeon. Sent Gallipoli plants to Petiver.

Talbot, William Henry Fox (1800–1877): b. Melbury, Dorset, 11th Feb. 1800; d. Lacock Abbey, Dorset, 17th Sept. 1877; bur. Lacock Cemetery. Nephew of Earl of Ilchester. Discoverer of photography. M.A., Camb., 1821. LL.D. F.L.S., 1829. F.R.S. Collected in Ionian Isles, 1826. Correspondent of Smith and W. J. Hooker. Smith Lett. ii. 293; 'Athenæum,' 1877, ii. 406; Trans. Soc. Biblic. Archæol. vi. 1879, pt. ii.

Tate, George (1802–1866): b. Alnwick, 21st May, 1805; d. same place, 7th June, 1866. 'Fossil Flora of Eastern Borders,' in Johnston's Bot. of East. Bord. pp. 289–317. R. S. C. v. 915; Proc. Berwicksh. Field Club, vi. 269.

Tate, George Ralph (1835–1874): b. Alnwick, 27th March, 1835; d. Fareham, Hants, 23rd Sept. 1874. M.D., Edinburgh.

F.L.S., 1869. Asst.-Surgeon, R. Artillery. Collected in China, 1859. Contrib. to 'Supplement to Fl. Vectensis.' 'Flora of Northumberland and Durham' (with J. G. Baker), 1867. Had a herbarium. Chinese plants at Kew. Jacks. 611; R. S. C. viii. 1861; Berwicksh. Nat. Club, vii. 334; Proc. Linn. Soc. 1874–75, lxiv.

Tatham, John (1793–1875): b. Settle, Yorks., 20th Sept. 1793; d. Settle, 12th Jan. 1875. Druggist. F.B.S.Ed., 1841. Assisted Windsor in 'Fl. Cravoniensis' and Baines in 'Fl. Yorkshire.' Had a herbarium. Eng. Bot. 2890, 2905; Journ. Bot. 1875, 64.

Taylor, Joseph (fl. 1812–1836). Of Newington Butts, Surrey. 'Arbores mirabiles,' 1812. Jacks. 611.

Taylor, Samuel (fl. 1806–1826). Of Moston, Manchester, afterwards of Bungay. 'Growth of Whitethorn,' Phil. Mag. 1806, 'Experiments on smut,' Phil. Mag. 1822, 350. Contrib. to Phil. Mag. 1806–26. R. S. C. v. 923.

Taylor, Thomas (d. 1848): d. Dunkerron, Kerry, Feb. 1848. M.D. F.L.S., 1814. Prof. Bot., Cork Scientific Institution. 'Muscologia Britannica' (with Sir W. J. Hooker), 1818. 'De Marchantieis,' Linn. Trans. xvii. 1835, 375. North Ireland Fungi, Mag. Zool. Bot. v. (1840), 3. Australian Mosses, Phyt. i. 1093. Herbarium and drawings at Boston, U.S.A. R. S. C. v. 923; Proc. Linn. Soc. i. 379; Journ. Bot. 1849, 63. *Tayloria* Hook.

Tedlie, Henry (1792 ?–1818 ?): b. 1792 ?; d. Cape Coast Castle, 1818 ? Assistant-surgeon to Bowdich's Mission to Ashantee. Materia Medica and Botany of the 'Mission,' 1819, pp. 370–4. Plants in Herb. Mus. Brit. Jacks. 349.

Teesdale, Robert (d. 1804): d. Turnham Green, Middlesex, 25th Dec. 1804. F.L.S., 1788. Gardener to Earl of Carlisle, at Castle Howard. British botanist. Friend of Smith. Discovered *Carex tomentosa*, 1799. 'Plantæ Eboracenses,' Linn. Trans. ii. 103. Phil. Trans. 1792; Bot. Guide, 663; Trans. Linn. Soc. xi. 283; Contrib. to E. Bot. 202, 2046, 2517, &c.; R. S. C. v. 927. *Teesdalia* Br.

Telfair, Charles (1777 ?–1833): b. Belfast, 1777 ?; d. Port Louis, Mauritius, 1833; bur. Cemetery, Port Louis. Surgeon. Founded bot. Gardens, Mauritius and Réunion. Correspondent of Sir W. J. Hooker, R. S. C. v. 929. 'Notice Historique,' by J. Desjardins, 1836. 'Life,' by Bojer. Bot. Misc. ii. 123; Journ. Bot. 1834, 150. Plants at Kew. Oil portr. at Freemason's Lodge, Port Louis. *Telfairia* Hook.

Telfair, Mrs. (d. 1832): d. Port Louis, Mauritius, 1832. Wife of preceding. Sent Mauritius Algæ to W. J. Hooker, described by Harvey in Journ. Bot. 1834, 147. *Thamnophora Telfairiæ* Hook. & Harv.

Templeton, John (1766–1825): b. Belfast, 1766; d. Cranmore, Malone, Belfast, 15th Dec. 1825. A.L.S., 1794. Orig. Memb. Belfast N. H. Soc. 1821. Found *Rosa hibernica*, *Orobanche rubra* (1805), *Entosthodon Templetoni*, &c. Contrib. to E. Bot. 508, 2196, &c.; Dillwyn's Confervæ, Turner's Fuci, Muscologia

Hibernica, &c. MS. 'Catalogue of . . . . pl. of Ireland,' 1793–1814, at Royal Irish Academy. R. S. C. v. 930; Mag. Nat. Hist. i. (1828), 403; ii. (1829), 305; Stewart & Corry. xvi.; Loudon, 'Arboretum,' 111. *Templetonia* Br.

Thicknesse, Ralph (1719?–1790): b. Bartomley, Cheshire, 1719?; d. Wigan, Lanc., 12th Feb. 1790. M.D. B.A., Oxon, 1730. M.A., 1736. 'Treatise on Foreign Vegetables,' 1749. Gent. Mag. 1790, i. 185.

Thompson, H. T. (fl. 1827). 'Vegetable Physiology' in Libr. Useful Knowledge, 1827. Jacks. 68.

Thompson, John (fl. 1798). 'Botany Displayed,' 1798. Pritz. 315; Jacks. 34.

Thompson, John (fl. 1843). Of Crow Hall Mill, Northumberland. Discovered *Carex irrigua* in 1843. E. B. Suppl. 2895.

Thompson, John Vaughan (fl. 1807–1829). Surgeon, 37th Regt. M.D.? A.L.S., 1807. F.L.S., 1810. Zoologist. 'Piper,' Linn. Trans. 1807. 'Cat. of Berwick Pl.,' 1807. Collected in Madagascar: plants in Brit. Mus. In Jamaica, 1829. Pritz. 315; Jacks. 249; R. S. C. v. 958. *Thompsonia* Br. = *Deidamia.*

Thompson, Silvanus (1818–1881): b. Liverpool, 20th March, 1818; d. Settle, Yorks., 3rd Feb. 1881. Schoolmaster. Contributed to 'Phytologist,' and Baines' 'Flora of Yorkshire.' Herbarium at Melbourne, Australia. Eng. Bot. 2890.

Thompson, Rev. T. (d. 1810): d. Penzance, 1810. Contrib. notes on *Daucus maritimus* to Withering's Bot. Arr. ed. 3, 290. Jones, Bot. Tour, 33.

Thompson, William (1805–1852). Vice-Pres., Belfast Nat. Hist. Soc. Algologist. 'Alga which colours Ballydrain Lake,' Mag. Zool. Bot. v. (1840), 75. Stewart & Corry, xv.; R. S. C. v. 960; Litho. portr. by T. H. Maguire, 1849, at Kew.

Thomson, Anthony Todd (1778–1849): b. Edinburgh, Jan. 1778: d. Ealing, Middlesex, 3rd July, 1849. M.D., Edinb., 1799. F.L.S., 1812. F.R.C.P. First Prof. Mat. Med., Univ. Coll., London, 1828. 'Lectures on Elements of Bot., 1822, Edited Thomson's 'Seasons,' with nat. hist. notes, 1847. Pritz. 315; Biogr. in Dr. E. A. Parkes' ed. of his 'Treatise of Skin-diseases,' 1850; Proc. Linn. Soc. ii. 91; Pharm. Journ. ix. 90. *Thomsonia* Wall.

Thomson, Sir Charles Wyville (1830–1882): b. Bonsyde, Linlithgow, 5th March, 1830; d. Edinburgh, 10th March, 1882. Zoologist. Knighted, 1876. LL.D., Aberdeen. F.R.S., 1867. F.L.S., 1872. F.B.S.Ed., 1847; Pres., 1871–2. Prof. Bot., Aberdeen, 1851. Chief of 'Challenger' Staff, 1872–4. Proc. Linn. Soc. 1881–2, 67. Trans. Bot. Soc. Ed. xiv. 278.

Thomson, George (fl. 1720–1742): M.D., Aberdeen. L.R.C.P., 1742. Practised at Maidstone. 'Virtues of Plants,' 1734. Jacks. 199; Munk, ii. 149.

Thomson, George (1819–1878): b. Balfron, near Glasgow, 26th May, 1819; d. Victoria, W. Africa, 14th Dec. 1878. Missionary in W. Africa from 1871. Contrib. to Hennedy's 'Clydesdale

Flora,' 1877; collected in Africa. Proc. Nat. Hist. Soc. Glasgow, iv. 51. 'Memoir,' 1881.

Thomson, Gideon (d. before 1855). Of Madras. Brother of Thomas Thomson. Collected in Madras, &c. Plants at Kew. Hooker & Thomson, 'Fl. Indica,' 73.

(To be continued.)

SHORT NOTES.

Hieracium holophyllum, n. sp. — Root-leaves persistent, rather deep green; stem with patent white hairs below, floccose upwards, with 1 to 3 leaves, corymbose-paniculate; peduncles arcuate-ascending, floccose; leaves somewhat coriaceous, oblong-ovate, entire, with about six minute denticulations along each margin, subglabrous above, slightly hairy below; root-leaves rounded and blunt at each end; secondary and stem-leaves pointed; involucres pale green, ovate, constricted in flower, markedly truncate below in fruit; phyllaries bluntish, floccose, with a few stiff hairs, which are black with white tips, and with a few setæ, their margins and tips pale green; outer phyllaries with lax tips; ligules glabrous at the tips; styles long, pure yellow, becoming slightly dusky with age. Related to *H. pallidum* Biv. and to *H. stenolepis* Hi. Scand. Its special and distinguishing features are the peculiar shape of the entire blunt green leaves, its pale green heads and their triangular shape in fruit, and the colour of the styles. It occurs sparingly on limestone rocks in Dovedale, Derbyshire, and was first noticed there on July 6th, 1887, by the Revs. W. H. Purchas, Aug. Ley, and myself. The name *holophyllum* will express one feature which is both prominent and distinctive. The above description, it should be added, is partly due to the kind help and valuable suggestions of Mr. Purchas.—Wm. R. Linton.

Autumn Flowering of Mercurialis perennis (See Journ. Bot. 1889, 22).—A few days ago I again found the autumnal-flowering form of *Mercurialis perennis* flourishing in its original habitat near Preston; this is about the seventh successive year I have seen it in flower at this time. This persistent flowering year by year seems to indicate that it is a permanent form.—F. J. George.

Additions to the Flora of Wilts.—The following are the additions to the Flora of Wilts of which notice has been sent to me during the past year. The numbers before the localities refer to the districts of Wilts: *Ranunculus Lenormandi* F. Schultz; 5, Hamptworth, *Tatum*. *Stellaria media* c *neglecta* Weihe; 10, Harnham, *Tatum*. *Spergula arvensis* a *vulgaris* Boenn.; 5, Whiteparish, and 10, Downton, *Tatum:* b *sativa* Boenn.; 1, Westbury, *Tatum*. *Potentilla procumbens* Sibth.; 10, Downton, *Rogers*. *Rosa canina* r *Koscinciana* Besser; 5, Landford, *Tatum*. *Callitriche hamulata* b *pedunculata* DC.; 5, Hamptworth, *Tatum*. *Petasites fragrans* Presl.; established at 10, Harewarren, *Tatum*. *Myosotis sylvatica* Hoffm.; 4, River Wood, very abundant on the borders of Wilts and

Berks, *Druce*. *Bartsia Odontites* a *verna* Reichb.; 3, Bishopstone, *Druce:* b *serotina* Reichb.; 2, Midford Hill and Corsham, *Rogers*. *Mentha arvensis* b *nummularia* Schreb.; 9, Tisbury, *Tatum*. *Polygonum mite* Schrank; 10, Harnham, *Tatum*. *Juncus supinus* d *uliginosus* Roth; 5, West Wellow, *Tatum*. *Rynchospora alba* var. *sordida;* 5, West Wellow, *Tatum*. *Agrostis vulgaris* c *nigra* With.; 3, Swindon, *Druce;* between Swindon and Chiseldon, *Clarke*. *Poa pratensis* b *subcœrulea* Sm.; 10, Harnham, *Tatum*. *Festuca fallax* Th.; 1, Limpley Stoke; 2, Kingsdown, Wraxhall and Midford; 4, Marlborough and Savernake, *Rogers*. A few other species and varieties stand over till more perfectly verified.—T. A. Preston.

Papaver hybridum in Denbighshire.—In Watson's 'Topographical Botany,' 1st edition, on page 590 of the Miscellaneous Notes, this plant is given as found in 50, Denbigh, on Mr. Webb's authority and described as "Rhyl, casually." Now Rhyl is in 51, Flint, which county was queried in the first part of the work, so doubtless Mr. Webb intended to confirm the latter, but managed to give the wrong county. This poppy used to grow on the sandy ground on the east side of Rhyl near the cemetery, and also by the footpath inland, on the other side of the railway. I found it in these two stations year after year until the Gladstone Bridge and a new road were made, when it disappeared, and I have not seen a specimen there for the last eight or ten years. This year in September, I saw a fair number of plants of this species in a field of mangolds, just bordering the sea-shore above the old salmon weir at Rhos Fynach, near Colwyn Bay. This is 50, Denbigh, and is the first time I have noticed it in this county. It will be interesting to see if it retains its hold there next year.—Robert Brown.

NOTICES OF BOOKS.

The Lejeuneæ of Lindenberg's Herbarium.[*]

Herr F. Stephani, of Leipzig, one of the most indefatigable of hepaticologists, has lately conferred a benefit upon other cryptogamic students by examining all the specimens of the genus *Lejeunea* in the herbarium of Lindenberg, now at Vienna, upon which many of the species recorded in the 'Synopsis Hepaticarum' were founded. He adopts the arrangement proposed by Dr. Spruce in 'Hepaticæ Amazonicæ et Andinæ,' where a natural division of this immense group into subgenera is attempted. Numerous mistakes are corrected, and since many of the older species were founded by Taylor, I have translated those notes most likely to interest British botanists, omitting a number of corrections previously recorded by Dr. Spruce and others.

It is perhaps desirable to call attention to the similarity in the names Lindenberg and Lindberg, in order to avoid the confusion often produced by the variable abbreviations of different writers. Lindenberg abbreviated his own name Ldbg. and also Ldg. Stephani insists upon the universal use of the former; Carrington, Spruce, and others, have been in the habit of writing Lindenb., which permits of no misunderstanding; while Lindb. should stand for Lindberg. In the 'London Catalogue' Lindenbg. is used for Lindenberg, whereas sometimes Lindbg., and at other times Lindb., stands for Lindberg. There can be no doubt, therefore, some uniformity in the use of the abbreviations is desirable.

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[*] Die Gattung Lejeunea in Herbarium Lindenberg, revifdirt von F. Stephani. Hedwigia, 1890, heft. 1—3.

THYSANTHUS ANGUIFORMIS Tayl., *Thysanolejeunea* Spruce, Nova Zelandia, Colenso. A true *Thysanthus*. Per. (plantæ junioris) in dichotomia, triquetra, plica ventralis plicatulis 2 vel 3 composita, superne remote dentata vel spinosa; folia acuta integerrima.

T. SCUTELLATUS Tayl., Nova Zelandia. Does not belong to this subgenus, but to *Archilejeunea* Spruce. Per. inferiora in dichotomia superiora tamen monotropa ventre bicarinata, inermia. Foliorum lobulus folio triplo brevior, oblongus, involutus, in foliis inferioribus parvus vel nullus.

T. OPHIOCEPHALUS Tayl., Nova Zelandia. Also belongs to *Archilejeunea*, and indeed is the male plant of *L. olivacea* Tayl., therefore must be cancelled.

PHRAGMICOMA ACUTILOBA (Tayl.), *Homalolejeunea* Spruce, St. Helena.

P. BACCIFERA Tayl., Nova Hollandia. A true *Platylejeunea*, with which Taylor's description of the perianth altogether agrees.

P. REPLETA (Tayl.), Madras, Wight. Belongs to *Mastigolejeunea* Spruce. This plant is a good species, and not identical with *M. humilis* (G.), nor *M. auriculata* (Wils.).

P. USTULATA Tayl., *Brachiolejeunea* Spruce. Philippine Islands.

P. TESTUDINEA Tayl., Para, not Cincinnati, is *Pycnolejeunea macroloba* N. & M.

LEJEUNEA CYCLOSTIPA Tayl., Para, *Archilejeunea Auberiana* Mont. pp. and *Lopholejeunea Sagræana* Mont. pp.

L. TENUIFOLIA Tayl., 340 Casapi. An indifferent specimen of *Omphalolejeunea filiformis* (Sw.); the species has therefore to be cancelled.

L. ROTALIS Tayl. to *Archilejeunea* Spruce.

L. MALACCENSIS Tayl. 436, Malacca, is identical with *Acrolejeunea Cumingiana* Mont.; the amphigastria are not obovato-rotunda, as Taylor says, but basi distincte angustata.

L. DOMINGENSIS Tayl. 470, St. Domingo. Identical with *Acrolejeunea polycarpa* N.

L. LINGUÆFOLIA Tayl. 474. St. Thomas. Identical with *Brachiolejeunea corticalis* L. & L.

L. OLIVACEA Tayl,, belongs to *Archilejeunea* Spruce. The cross-section of the perianth shows upon the ventral folds yet smaller and shorter ones which look like rough protuberances; Mitten describes the perianth upon these grounds (Handb. N. Z. Flora, p. 532), as 3-ribbed on either face; the plant has branches produced from its base whose leaves have very small rudimentary lobules; such a specimen Mitten probably had before him, when he (*l. c.*) described the lobulus folii as "small, oblong, acute, tumid, entire." On the contrary, in its normal condition it is extremely large, and if but slightly magnified appears distinctly bidentate.

L. SPHÆROPHORA L. & L., 477, Mauritius, Sieber. Dr. Schiffner has referred this plant to *Phragmicoma*, but it is undoubtedly a true *Lopholejeunea* S., and is allied to *L. Sagræana* and *applanata*, with which it agrees in habit; in addition to perianth and bracts, the tumid leaf-lobe is quite that of *Lopholejeunea*. In reality there is no such a genus as *Phragmicoma*, which is a conglomeration of very different species; to Dr. Spruce belongs our thanks for having been the first to separate it into natural groups; no one before him could have done so, not only on account of his keen powers of observation and the many years of study which he has devoted to the Hepaticæ, but that in his South American travels he collected plants so intelligently, in such quantity, and in such perfect condition, that this knowledge became at all possible, in striking contrast to the small imperfect specimens which the authors of the 'Syn. Hep.' and their successors had to make use of.

L. ADGLUTINATA Tayl., 509, Cayenne, Tayl. The common form of *L. Peruviana* L. & L.

L. EPITHETA Tayl., 510, Ind. Occid. Tayl. Nothing but a poor specimen of *L. Peruviana* L. & L.

L. CRUCIANELLA Tayl., 592, Demerara, Tayl. According to Spruce's description, *L. crucianella* belongs to *Leptolejeunea*, and he has evidently had the original plant before him; our 592, on the contrary, belongs to *Cololejeunea*, and is the same as a plant of which I possess good specimens with perianths from Sao Francisco, leg. Ule, which I have named *L. papilloba*.

L. POLYPLOCA Tayl., 665, Insul. Pacific, Tayl. Identical with *L. trifaria* N.

STREPSILEJEUNEA COMITANS H. & T., 686, New Zealand, Tayl. Perianthia inflata, obovato-pyriformia, haud plicata. Monoica.

HYGROLEJEUNEA CORDIFISSA Tayl., *L. cerinæ* simillima; species dubiosa. (From the examination of Taylor's original specimens, I should consider this a very good and distinct species, the remarkable crenulation of the leaves and underleaves described by Taylor is a striking character. In the specimens of *L. cerina* and its var. *Liebmaniana* there is no approach to this feature.—W. H. P.) If such is the case, my plant is not *L. cordifissa*, but a form of *L. cerina* (Stephani).

LEJEUNEA ASCENSIONIS Tayl., Ascension Island. Identical with *Lejeunea pterota* Tayl.

L. ALBIFOLIA Tayl., Oware, Pal. Beauvais. Perfectly identical with *Diplasiolejeunea pellucida* Meiss.

L. LONGIFLORA Tayl., Para, is a synonym for *L. trifaria* N.

EULEJEUNEA LUCENS Tayl. Spruce places it with *Microlejeunea*, but this subgenus is characterised throughout by a very large leaf-lobule, which often reaches almost to the apex of the leaf, and which gives to these plants a very characteristic feature, and being squarrosely branched with distant leaves, becomes more noticeable;

I should therefore include plants like *L, lucens* with the small species of *Eulejeunea*, of which Spruce has already grouped together a number.

MICROLEJEUNEA ULICINA Tayl., 972, Dunkerron, Tayl. Taylor wrote himself, in 1840, upon the packet containing this plant, "In *Jungermannia minutissima* desunt stipulæ"; since that time there has been a vexatious confusion in the synonymy of these two plants, which need not be discussed here. (In Trans. Bot. Edin. i. 115, where his *J. ulicina* is published, Dr. Taylor says, "This minute species . . . has been confounded with *J. minutissima* Smith, to which it bears a very strong resemblance. It may be distinguished by the presence of stipules," &c.—W. H. P.).

M. ALBO-VIRENS Tayl., 973, Auckland Isles, Hooker. What may have induced Mitten (in Hooker's 'Handbook of the New Zealand Flora' p. 533) to group together 1, *L. rufescens*, 2, *implexicaulis*, 3, *mimosa*, 4, *albo-virens*, and 5, *primordialis*, under the name *Lejeunea rufescens* is to me incomprehensible; all five plants are not only five quite different species, but belong to three different genera, *viz.*, 1 and 2 to *Euosmolejeunea*, 3 *to Strepsilejeunea*, 4 and 5 to *Microlejeunea*.

W. H. PEARSON.

Artificial Keys to the Genera and Species of Mosses recognised in Lesquereux and James's 'Manual of the Mosses of North America.' By CHARLES R. BARNES, Prof. of Botany in the University of Wisconsin, Madison, Wis. 8vo., pp. 71. Price 50 cents.

THIS pamphlet is re-published from vol. viii of the Transactions of the Wisconsin Academy of Sciences, Arts and Letters, 1890.

In 1884, the 'Manual' by Lesquereux and James appeared. Two years later, Mr. Barnes published a key to the genera which are recognised in the 'Manual.' It was in such demand that the edition soon became exhausted. In preparing the second edition the author has increased the value of the work tenfold, by constructing an analytic key to the species. And this part of the pamphlet, we venture to think, will be found by the student to be of far greater assistance than the key to the genera; for the latter is based so largely upon the characters of the capsule and its parts that, unless the specimens bear fruit, the student is unable to apply the key for the determination of the genus to which they belong. But when once he has made certain of the genus, the student stands a very good chance of making out the species; for in this case the characters of leaf and stem play an important part.

We believe that Mr. Barnes would vastly enhance the value of his work if he were to introduce a conspectus of tribes somewhat in the style of that which Mr. Mitten has given us in his "Musci Austro-Americani" (Journ. Linn. Soc. xii., 1869, pp. 9 et seqq.), where the characters of stem and leaf are brought into prominence. However, notwithstanding the objection urged above with reference to the genera, we consider Mr. Barnes's keys to be an extremely valuable addition to the bryological literature of North America, in making good what is a very serious omission in Lesquereux and James's 'Manual.' The author has brought his work up to date, by including all new species published up to the present year, and by embodying his own researches into the genus *Fissidens*, and those of M. Cardot into the more puzzling *Sphagnum*. There is a queer printer's error in the introduction, which makes it appear that the expected publication of several new species in certain journals is, instead of being worth noting, "worth nothing."

A. G.

A List of the Marine Algæ of Berwick-on-Tweed. By E. A. L. Batters, B.A., LL.B., F.L.S. [Reprinted from the Berwickshire Naturalists' Club Transactions, 1889]. Alnwick, pp. 171, tab. 5.

Mr. Batters is to be congratulated on the publication of his admirable list. The performance is practically his own from beginning to end, since as a foundation he had merely the meagre enumeration of the seaweeds of this district made thirty-five years ago by Dr. Johnston. There is probably no other locality in Britain so rich in species as the coast northwards of Berwick-on Tweed, and when it is stated that the exploration of it has been accomplished by Mr. Batters almost, if not, single-handed, the student of phycology will know the extent of labour and research involved. To do this thoroughly Mr. Batters has visited Berwick at all seasons, and has made particular note of those minute forms—microscopic forms as they are called—so commonly overlooked. This examination has led to the discovery of forms new to science, as well as to Britain, among which may be mentioned here the generic form *Battersia* of Reinke. There was another difficulty in performing this task. Since the publication of Harvey's 'Phycologia Britannica,' the nomenclature of British Algæ has been revolutionized and numerous species have been added of which there has been little more than obscure record made in journals. He had therefore to adopt a new system in consonance with modern lights in phycology. In this again Mr. Batters has been not only judicious in selecting from among rival systems, but almost painfully exact in the quotation of names, &c.

Under each species there are cited, a published description, figure, no. in exsiccata, synonymy (where such exist), its habitat, and in nearly all cases a discussion of the position, affinities, &c., of the species. At the beginning there is an introduction dealing with the distribution of the species in the district, and a list of classes, orders and genera. At the end an artificial key, a bibliography, index and description of plates, as well as a list of the species in the 'Phycologia Britannica' that have changed name since its publication, both old and new names being given. From the list it appears that there are 119 genera and 271 species in the Berwick Marine Flora,—a very limited district,—and 78 of these species have been added to the British Flora, since the publication of the 'Phycologia Britannica.'

It hardly needs saying, therefore, that we have here by far the most solid contribution to British phycology since the publication of Harvey's 'Phycologia'—and one that will whet the appetite for the forthcoming new 'Phycologia,' by Messrs. Batters and Holmes. From what has been said it will be seen that we have in this Marine Flora a record of true and faithful research, which establishes Mr. Batters's position in the front rank of British phycologists past and present.

G. M.

" Articles in Journals " for November is unavoidably postponed.

OBITUARY.

Isaiah Waterloo Nicholson Keys, the author of 'Flora of Devon and Cornwall,' died at his residence in Whimple Street, Plymouth, on Nov. 4th. Mr. Keys was the son of Elias Keys, a printer and bookseller of Devonport, where he was born, March 12th, 1818. He resided during the greater part of his life in Plymouth, where he carried on for a number of years a printing and bookselling business. More recently he gave up the bookselling department, but continued the printing, in conjunction with one of his sons, until the time of his death. Mr. Keys was a man of great industry and considerable mental vigour, and had a taste for literature as well as for science; in the earlier days of the movement for providing cheap literary evening entertainments for the people he often appeared as a reader of extracts from the works of Dickens and other standard writers, and in this character was in much request, as he possessed considerable histrionic power. He was an old member of the Plymouth Institution and Devon and Cornwall Natural History Society, in the 'Transactions' of which body his 'Flora of Devon and Cornwall' appeared between the years 1866–71; it being issued in five portions, each of which was reprinted at the period of issue for private circulation. Mr. Keys also contributed to the pages of the old series of the 'Phytologist' an article entitled "Plants found in Devonshire and Cornwall in addition to those contained in Jones' 'Flora Devoniensis' and in the 'Phytologist'" (Phytol. iii. 1022–24, 1850). For many years previous to his death he suffered greatly at times from severe attacks of asthma. He was buried at the Plymouth Cemetery, on Nov. 8th.—T. R. A. B.

James Shirley Hibberd, a well-known and prolific horticultural writer, died at his residence at Kew, on the morning of Sunday, Nov. 16th. Mr. Hibberd was born at Stepney in 1825, and for forty years his name has been familiar to the public in connection with garden literature, flower-shows, and the like, a large number of books and more than one newspaper owing their existence to his energy. In 1870 he issued a little book on British plants, entitled 'Field Flowers: a handy book for the rambling botanist,' which in no way differs from other works of the kind, save, perhaps, in the badness of its illustrations; and he also supplied the text for Cassell's 'Familiar Garden Flowers.' Mr. Hibberd was buried at Abney Park Cemetery on Nov. 22nd. A portrait and memoir will be found in the 'Gardeners' Chronicle' of that date.

EDITORIAL.

The present seems a fitting opportunity to indicate one or two changes which will be made in this Journal in the coming year. We have nothing sensational to announce, no startling improvements to advertise. Our scope is limited, our aims are humble, though useful; and the way in which they are carried out must mainly depend, as it always has depended, upon the kind and willing co-operation of those to whom the Journal owes whatever success it may have attained—a co-operation which was never more valuable and readily accorded than at the present time.

Although botanists may now be congratulated on the possession of another publication devoted to their interests, supported by an eminent and influential staff of writers, and financed in a manner which permits the production of elaborate and expensively illustrated memoirs, the Journal of Botany still remains the only medium of communication in England which appears at regular intervals, and in which immediate publication can be secured. It is, moreover, the recognised record for matters relating to British Botany in its various aspects and branches, and for the placing on record of observations, too small in themselves to attract the notice of the more profound student, but nevertheless worthy of note: the number of systematic papers published in its pages may also be referred to with satisfaction. The 'Annals of Botany,' with its high subscription rate and irregular issue, does not aim at filling the humbler, but we hope not less useful, position, which we have striven—not unsuccessfully, we trust—to fill; and this is shown by the fact that our subscribers have increased rather than diminished in number during the last four years.

One conspicuous feature of this Journal some years since was the "Botanical News," in which were recorded small matters, often of passing interest, such as come within the ken of those in constant intercourse with fellow-botanists and botanical literature: this we propose to restore. We also intend to publish, as early in the year as possible, a short notice—on the lines of the 'Biographical List,' now nearly completed—of botanists in all parts of the world who have died during 1890. The pressure upon our pages has this year caused us to omit the List of New Species published in Britain during 1889, and if the pressure continues,—and we can hardly wish for its cessation—this, although useful, will have to be abandoned. We hope to notice, even if briefly, a larger number of the publications which reach us from time to time, some of which have, we fear, been neglected; and it is our wish to increase the number of plates and other illustrations. This last improvement, however, must largely depend upon a like increase in the number of our subscribers. We are quite willing to continue our editorial work, which is still almost unremunerative, although the Journal at present does not —as at one time was the case—involve any pecuniary loss; but we can hardly be expected to find also the means by which the work is to be carried on. There are still some who might readily afford the small annual sum required, who are not at present upon our list of subscribers; and we venture to appeal to them for support.

All contributions to the Journal, books for review, &c., should be addressed to 18, West Square, Southwark, S.E. Subscriptions and advertisements should be sent to the publishers, Messrs. West, Newman & Co., 54, Hatton Garden, E.C.

James Britten.

Among the papers already in hand for 1891 may be mentioned:—

A List of First Records of British Plants, by W. A. Clarke, F.L.S.

A Key to the Genera and Species of British Mosses (with plates), by the Rev. H. G. Jameson.

On Galls in *Rhodymenia* (with plate), by Ethel S. Barton.

On the Histology of *Polysiphonia fastigiata* (with plate), by R. J. Harvey Gibson, M.A., F.L.S.

New Fungi from Madagascar (with plate), by George Massee, F.R.M.S.

Madagascar Ferns, by J. G. Baker, F.R.S.

The Moss-Flora of the Doward Hills, by the Rev. Augustin Ley, M.A.

Biography of Robert Uvedale, by G. S. Boulger, F.L.S.

INDEX.

For Classified Articles, see—Articles in Journals; County Records; Obituary; Reviews. New species and varieties published in this volume are distinguished by an asterisk.

Adiantum Balansæ,*262.
Æchmea Donnellsmithii,* 305: isabellina,* 305; squarrosa,* 305
Alberg's 'Floral King' (rev.), 316
Aldrovandi's Herbarium, 277
Algæ of Arbroath, 10; Reinke's Atlas (rev.), 60; of Devon, 147; Cooke's Fresh-water (rev.), 250; of Hampshire, 334; of Berwick (rev.), 381
Alpine Flora (rev.), 254
Alsophila theosara,* 262
Althæa, Synopsis of, 140, 207; dissecta,* 143; Loftusii,* 145
Andean Plants, 161
Anisopoda, 63
Antrophyum vittarioides,* 267
Arabis albida, 282
Arenaria gothica, 282
Arnold's 'Flora of Sussex' (rev.) 253
ARTICLES IN JOURNALS:—
  Annals of Botany, 94, 191, 319
  Bot. Centralblatt, 31, 63, 94, 123, 158, 191, 221, 255, 287, 319, 352
  Bot. Gazette, 63, 95, 123, 158, 191, 221, 287, 319, 352
  Bot. Notiser, 31, 95, 191, 221, 319
  Bot. Zeitung, 31, 63, 95, 123, 158, 222, 255, 287, 319, 352
  Bull. Soc. Bot. Belg., 95
  Bull. Soc. Bot. France, 31, 95, 123, 255, 288, 319
  Bull. Torrey Club, 31, 96, 123, 158, 191, 222, 255, 288, 352
  Gardeners' Chronicle, 31, 63, 96, 123, 159, 191, 222, 255, 288, 320, 352
  Journ. de Botanique, 96, 124, 159, 191, 222, 288, 320, 352
  Journ. Linn. Soc., 63, 159, 191
  Journ. R. Microscop. Soc., 96
  La Nuova Notarisia, 159, 222, 288
  Midland Naturalist, 255
  Notarisia, 63, 288, 352
  Nuov. Giorn. Bot. Ital,, 63, 159, 255
  Œsterr. Bot. Zeitsch., 32, 64, 96, 124, 159, 191, 222, 256, 288, 320, 352
  Proc. Royal Irish Acad., 256
  Scottish Naturalist, 64, 256, 352
  Trans. Bot. Soc. Edinb., 32
Asplenium lepidorachis,* 264; megaphyllum,* 264; platyphyllum,* 264

Babington, C. C., Rubus Dumnoniensis,* 338
Bagnall, J. E., Gerard's 'Science and Scientists' (rev.), 59
Bailey, L. H., Carex rigida, 171
Bailey's 'Supplement to Queensland Flora,' 286
Baker, E. G., Synopsis of Malveæ, 15, 140, 207, 239, 339, 367; New Plants from the Andes, 161
Baker, J. G., New Guinea Ferns, 103; Tonquin Ferns, 262; Guatemalan Bromeliaceæ, 305: appointed Curator at Kew, 217; his Bromeliaceæ (rev.), 24
Ballia, 128
Barclay, A., Indian Rusts and Mildews, 257
Barnes' 'Keys to Mosses' (rev.), 380
Barrett-Hamilton, G., Wexford Plants, 87
Barrington, R. M., Trientalis europæa, 315
Batters' 'Algæ of Berwick' (rev.), 381
Beeby, W. H., Potamogeton fluitans, 203; Rumex propinquus, 217; Sparganium, 234
Benbow, J., Middlesex Plants, 120
Bennett, A. W., Pringsheimia, 92
Bennett, Arthur, Iceland Records, 78; Potamogeton Notes, 91, 92;

P. fluitans, 248; Potentilla macculata, 249; Nomenclature of Potamogetons, 297
Bonia, 124
Boswell, H., Memoir of J. B. Wood, 86
Boulger, G. J., Biographical Index of Botanists, 19, 52, 89, 116, 151, 184, 243, 279, 306, 345, 373
Brachyachenium, 63
Brachypodium pinnatum, 315
Braithwaite, R., Hypnum circinale, 315; 'Moss-Flora' (rev.), 350
Briggs, T. R. A., Rubus erythrinus, 204; R. sylvaticus, 274, 350; Rosa Briggsii, 350; I. W. N. Keys, 382
Brit. Mus. Bot. Depart. for 1889, 283
Britten, J., Biographical Index of Botanists, 19, 52, 89, 116, 151, 184, 243, 279, 306, 345, 373; Buda v. Tissa, 157, 295; Nomenclature, 372; Spergula pentandra in Ireland? 302; Editorial, 383
Britton, N. L., Botanical Nomenclature, 371
Bromeliaceæ, Handbook of (rev.), 24; New, 305
Brousemichia, 222
Brown, N. E., on Stapelieæ, 142
Brown, R., Papaver hybridum, 377
Buda v. Tissa, 157, 295
Butler, C., Irish Plants, 361

Caddy's 'Linnæus' (rev.), 316
Campanula Barbeyi,* 171; Brotherorum,* 273; cantabrica,* 273; Cephallenica,* 273; erucifolia,* 268; fenestrellata,* 272, garganica, 269; istriaca,* 271; lepida,* 272; lyratella,* 269; Sporadum,* 268
Cantherellus Whymperi,* 161
Carex montana, 350; rigida, 171; tomentosa, 218
Carruthers, J. B., McAlpine's 'How to know Grasses' (rev.), 220
Carruthers, W., On early Flora of England, 222; Report of Bot. Dep. Brit. Mus., 1889, 283; Books on Linnæus (rev.), 316
Cesalpini's Herbaria, 277
Chara fragilis, 189
Characeæ Notes, 1887—9, 65
Clarke, C. B., Cyperus Jeminicus, 18
Closterium striolatum, b. orthonotum,* 336
Cooke's 'Fresh-water Algæ' (rev.), 250
COUNTY RECORDS:—
  Anglesea, 315
  Bedford, 315, 349
  Berks, 66, 68
  Brecon, 65
  Buckingham, 315
  Cambridge, 137, 173, 204, 321
  Cardigan, 188, 287
  Carnarvon, 65, 188, 350
  Cornwall, 66, 129, 276, 292, 366, 382
  Cumberland, 66, 219, 354
  Denbigh, 189, 377
  Derby, 8, 9, 103, 129, 133, 282, 376
  Devon, 6, 8, 65, 96, 99—102, 129—135, 147, 206, 236, 276, 339, 359, 382
  Dorset, 66, 100—103, 129, 130, 132—135, 206, 236, 276
  Essex, 192, 236
  Glamorgan, 157, 218
  Gloucester, 206, 218, 282
  Hants, 50, 66, 68, 96, 99—102, 129, 130, 132—135, 206, 334, 349, 351
  Hereford, 206, 236
  Herts, 66, 276
  Huntingdon, 204
  Kent, 4, 5, 69, 188, 218, 349
  Lancaster, 66, 376
  Merioneth, 248, 287, 353
  Middlesex, 68, 120
  Norfolk, 65, 92, 101, 103
  Northampton, 66, 121
  Northumberland, 381
  Oxford, 121, 227
  Pembroke, 236, 339
  Radnor, 5
  Salop, 276, 350
  Somerset, 133, 206, 284, 315, 349
  Stafford, 102
  Suffolk, 4, 66, 92, 206, 236, 282
  Surrey, 3—10, 102, 103, 132, 204, 276
  Sussex, 32, 66, 204, 248, 253, 284, 351
  Warwick, 102, 139, 160
  Westmoreland, 69
  Wilts, 57, 66, 236, 276, 350, 376
  Worcester, 9, 65, 66, 255
  York, 4, 102, 157, 282, 353
Cosmarium Turneri,* 337
Crepis fœtida, 121; nicæensis, 315; taraxacifolia, 248
Cromer beds, plants of, 223

Cyathea Macgregorii, 104; Muelleri,* 104
Cyperus Jeminicus, 18

Darlington's 'Naturalist Series,' 287
Davallia cicutarioides,* 166; phanerophlebia,* 262
Davis' 'Flowering Plant' (rev.), 189
Dianthus gratianopolitanus, 316
Dicksonia rhombifolia,* 105
Distiacanthus, 26
Docidium coronatum, 335; Farquharsoni,* 335
Donnellsmithia, 95
Drosera anglica, 349; Beds. species, 349
Druce, G. C., Scottish Plants, 39; Crepis fœtida, 121; Carex tomentosa, 218; Oxford Plants, 227; Helianthemum guttatum, 315; Spergula pentandra in Ireland, 343

Early Flora of England, 222
Egerton-Warburton's 'Names of Brit. Plants' (rev.), 28
Elliott, G. F. S., Xysmalobium, 362
England, early Flora of, 222
Epicladia, 62
Epilobium notes, 2
Euphrasia capitulata,* 164

Farquharson, R. F. O., 334
Feer, H., New Campanulas, 268
Ferns of New Guinea, 103; of Tonquin, 262; Indian, 145, 326
Fernseea, 26
Ferro's Herbarium, 278
Festuca heterophylla, 47; arundinacea *var.* dubia,* 50
Fitzgerald, R. D., Pavonia hastata, 217
Flower, T. B., Lepidium Draba in Wales, 218
Focke, W. O., English Rubi, 97, 129
Fryer, A., Potamogetons, 137; Supposed hybridity in, 173; P. falcatus, 219; P. crispus, 225; P. fluitans, 249; P. crassifolius, 321

Galpin's 'Plants of Harleston' (rev.), 92
George, F. J., Autumn flowering of Mercurialis perennis, 376
Gepp, A., Braithwaite's 'Moss-Flora' (rev.), 350; Barnes's Artificial Moss-Keys (rev.), 380
Gerard's 'Science and Scientists' (rev.), 59
Ghini's Herbarium, 276
Girault's Herbarium, 277
Glascott, L. S., Wexford Plants, 87
Grasses, Agricultural (rev.), 122, 220
Gray's (Asa) 'Scientific Papers' (rev.), 121
Gregory's Herbarium, 277
Groves, H. & J., British Characeæ, 1887—9, 65; John Ralfs, 289
Gymnogramme digitata,* 267; longisora,* 267

Halothrix, 61
Hanbury, F. J., Highland Plants, 179; Ranunculus ophioglossifolius, 282; James Backhouse, 353; his 'British Hieracia' 94
Hartig's 'Timbers' (rev.), 318
Helianthemum guttatum, 315
Helosis Whymperi,* (t. 297), 161
Hemsley, W. B., Triumfetta subpalmata,* 1; Marianne North, 329; appointed to Kew Herbarium, 216
Hepaticæ, Irish, 200, 356; Bolivianæ (rev.), 252; of Lindenberg's Herbarium, 377
Herbaria, Old, 276
Hieracia, Hanbury's British, 94
Hieracium holophyllum,* 376
Hind, W. M., Arabis albida naturalised, 282; his 'Flora of Suffolk' (rev.), 92; his herbarium, 282
Holmes, E. M., Devon Algæ, 147
Hope, C. W., Lastreas from Assam, 145, 326
Hybridity in Potamogeton, 17 321
Hymenophyllum ooides,* 105 oxyodon,* 262
Hypnum circinale, 315

Iceland Records, 78
Indian Rusts and Mildews (t. 298 257
Irish Plants, 65, 66, 68 69, 87, 110, 200, 237, 256, 303, 343, 354, 356, 361
Introduced plants in Cornwall, 36

Jack, J., Arbroath Algæ, 10

Jackson, J. R., Hartig's 'Timber' (rev.), 318
Juglandeæ, Fruit of, 124

Kew, Changes at, 216
Kirk's 'Forest Flora of N. Zealand' (rev.), 29
Kitaibelia, Synopsis of, 16
Kjellmannia, 61

Lavatera, Synopsis of, 210, 239; microphylla,* 211
Lejeunea Rossettiana, 157
Lejeuneæ of Lindenberg's Herbarium (rev.), 377
Lepidium Draba, 188, 218; ruderale, 188
Leptonema, 61
Lindneria, 288
Lindsaya tricrenata,* 106
Linnean Society, 32, 64, 96, 124, 160, 192, 222, 256
Linton, E. F., Glamorgan Plants, 157; Carex montana, 350
Linton, E. F. & W. R., Scottish Plant-notes, 167
Linton, W. R., Hieracium holophyllum,* 376
Lubbock, Sir J., on Fruit of Juglandeæ, 124; on shape of Oak-leaf, 125; on leaves of Viburnum, 126; on Stipules, 127
Lycopodium Macgregori,* 109

McAlpine's 'How to know Grasses' (rev.), 220
McArdle, D., Irish Mosses, 237; Hepaticæ, 356
Malope, Synopsis of, 16
Malva, Synopsis of, 242, 339, 367; borealis, 349; Duriæi,* 340; subacaulis,* 340
Malveæ, Synopsis of, 15, 140, 207, 239, 339, 367
Marshall, E. S., Epilobium Notes for 1889, 2; Festuca heterophylla, 47; Highland Plants, 179; Kent Plants, 218
Masdevallia (rev.), 32
Massee, G., Monograph of Podaxis, 33, 69
Massia, 222
Melampsora Lini, 259
Mercurialis perennis, 376
Microspongium, 61
Mildews, Indian, 257
Miller, W. F., New Scottish Records, 23
Monington, H. W., Merioneth Plants, 248
Moorea, 255
Murray, G., Vuillemin's 'Biologie Végetale' (rev.), 57; Cooke's 'Freshwater Algæ' (rev.), 250; Batters's 'Marine Algæ of Berwick' (rev.), 381
Myles, P. W., Davis' 'Flowering Plant' (rev.), 189

Nephrodium assamense,* 326; coriaceum,* 328; Mannii,* 145; obovatum,* 265; quinquefidum,* 265; setulosum,* 265; simulans,* 106; stenopteron,* 265; subtriangulare,* 327
New Books, 94, 287
New Guinea Ferns, 103
New Zealand Forest Flora (rev.), 29
Nitella Nordstedtiana (t. 296), 66
Nomenclature, 157, 295, 371

Oak-leaf, shape of, 125
OBITUARY:—
  Backhouse, James, 353
  Becker, Lydia Ernestine, 320
  Clarke, Benjamin, 84
  Clarke, Joshua, 192
  Hibberd, Shirley, 382
  Keys, Isaiah W. N., 382
  McNab, William Ramsay, 51
  North, Marianne, 329
  Ralfs, John, 289
  Wood, John Bland, 86
Oliver, Prof., retiring from Kew Herbarium, 216
Orchids, Middlesex, 120

Palaua, Synopsis of, 17
Papaver hybridum, 377
Pavonia hastata, 217
Pearson, W. H., Scapania planifolia, 219; Spruce's 'Hepaticæ Bolivianæ' (rev.), 250; Lejeuneæ of Lindenberg's Herbarium (rev.), 377
Podaxis, Monograph of, 33, 69 (tt. 294—5); ægyptica, 76; axata, 75; carcinomalis, 75; Emerici, 77; Farlowii,* 76; indica, 74; Mossamadensis, 76
Polygonum arifolium in Kerry, 111
Polypodium bipinnatifidum,* 109; davalliaceum,* 108; Knutsfordianum,* 107; locellatum,* 108; loxoscaphoides,* 107; megacuspe,* 266; mollipilum,* 107;

Musgravianum,* 108; scabristipes,* 108; Stanleyanum,* 107; subselligueum,* 107; tonkinense,* 266; trichopodum,* 107; undosum,* 108
Potamogeton notes, 91, 92; hybridity in, 173; nomenclature of, 297; crassifolius * (t. 299), 321; crispus, 225; decipiens, 137; falcatus, 219; fluitans, 203, 249; sibiricus,* 300
Potentilla maculata, 248
Preston, T. A., Wilts Plants, 57, 376
Pringsheimia, 62, 92
Priority in Nomenclature, 157, 295, 371
Pteris dissitifolia,* 263
Puccinia digraphidis,* 213; Fagopyri, 261; Sorghii, 257

Ranunculus ophioglossifolius, 282
Reinke's 'Meeresalgen' (rev.), 60
Rendle, A. B., 'Handbook of Bromeliaceæ' (rev.), 24
Reviews :—
  Handbook of the Bromeliaceæ. J. G. Baker, 24
  Names and Synonyms of British Plants. G. Egerton-Warburton, 28
  Index of British Plants. R. Turnbull, 28
  The Forest Flora of New Zealand. T. Kirk, 29
  Manual of Orchidaceous Plants. Part V. Masdevallia, 30
  La Biologie Végétale. P. Vuillemin, 57
  Science and Scientists. J. Gerard, 59
  Atlas Deutscher Meeresalgen. J. Reinke, 60
  Flora of Suffolk. W. M. Hind, 92
  Plants of Harleston. F. W. Galpin, 92
  Scientific Papers of Asa Gray, 121
  Agricultural Grasses. W. Wilson, 122
  The Flowering Plant. I. B. Ainsworth Davis, 189
  How to know Grasses. A. N. McAlpine, 220
  Introduction to Fresh-water Algæ. M. C. Cooke, 250
  Hepaticæ Bolivianæ. R. Spruce, 252
  Flora of Sussex. F. H. Arnold, 253
  Taschenflora des Alpen-Wanderers. C. Schröter, 254
  Handbook of Flora of Extra-tropical South Australia. R. Tate, 285
  Through the Fields with Linnæus. Mrs. Caddy, 316
  The Floral King. A. Alberg, 316
  Timbers, and how to know them. R. Hartig, 318
  British Moss-Flora. R. Braithwaite, 350
  The Lejeuneæ of Lindenberg's Herbarium. F. Stephani, 377
  Artificial Keys to Mosses. C. R. Barnes, 380
  Marine Algæ of Berwick-on-Tweed. E. A. L. Batters, 381
Rhachidospermum, 221
Roberts, W., Introduced plants in W. Cornwall, 366
Rolfe, R. A., Scaphosepalum, 135
Roper, F. C. S., Crepis taraxacifolia, 248; Welsh records, 350
Rosa micrantha *var.* Briggsii, 350
Roy, J., Freshwater Algæ of Hampshire, 334
Rubus, Focke's notes on, 97, 129, 166; anglosaxonicus, 166; Dumnoniensis,* 339; erythrinus, 204; pulcherrimus, 166; silvaticus, 274, 350; viridis, 166
Rumex propinquus, 217, 256
Rusts, Indian, 257

Salmon, E. S., Malva borealis, 349
Saunders, J., Crepis nicæensis, 314; Brachypodium pinnatum, 314; Droseras, 349
Scapania planifolia, 219
Scaphosepalum, Synopsis of, 135
Sciadium Arbuscula, 121
Schröter's 'Taschenflora,' 254
Scott, D. H., Reinke's 'Meeresalgen' (rev.), 60
Scottish Plants, 3—14, 23, 32, 39, 64—70, 96, 167, 179, 217, 236, 248, 256, 315, 339, 352, 354
Scully, R. W., Kerry Plants, 110; Kerry Hepaticæ, 200
Selaginella tonkinensis,* 268
Soppitt, H. T., Puccinia digraphidis,* 213
Spergula pentandra, 302, 343
Spruce's 'Hepaticæ Bolivianæ (rev.), 252
Stapelieæ, Genera of, 149

Staurastrum glabrum, 337
Stephani's 'Lejeuneæ' (rev.), 377
Stipules, 127
Sugar-cane, fertilisation of, 128, 303
Symphoricoccus, 61

Tæniopleurum, 63
Tate's 'Handbook of S. Australian Flora' (rev.), 285
Tillandsia sparsiflora,* 306
Tonquin Ferns, 262
Townsend, F., Euphrasia capitulata,* 162
Trientalis europæa, 315
Triumfetta subpalmata,* (t. 293), 2
Tunica, Synopsis of, 193; gracilis,* 196
Turnbull's 'Index of Brit. Plants' (rev.), 28

Uromyces Pisi, 260

Veitch's 'Orchidaceous Plants' (rev.), 30
Viburnum, leaves of, 126
Vuillemin's 'Biologie Vegetale (rev.), 57

Weathers, J., 'Masdevallia' (rev.).30
West, W., Sciadium Arbuscula, 121; Lejeunea Rossettiana, 157
White, J. W., N. Devon Rubi, 22
Whitwell, W., Lepidium Draba & L. ruderale in Wales, 188; Chara fragilis, 189; Arenaria gothica, 282
Whymper's Andean Plants, 161
Williams, F. N., Tunica, 193; Plants described by Arduino, 293; Dianthus cæsius, 316
Wilson's 'Agricultural Grasses' (rev.), 122

Xysmalobium, Monograph of, 362; angolense,* 365; confusum,* 363; Gerrardi,* 364; Holubii,* 365; parviflorum,* 363; Stockenstromense,* 364

Zosterocarpus, 319

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